

**A REPORT FROM THE STATE-LEVEL
HIE CONSENSUS PROJECT**

**Advancing Effective
State-level Approaches to
Interoperability in the
New Federal Context**

**Realizing State-level HIE Value
and Sustainability**

May 15, 2009

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**State Level
Health
Information
Exchange**

Submitted to the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology (ONC) as a research initiative and deliverable of the State-level HIE Consensus Project. As such it does not represent the views or opinions of ONC.
Contract Number: HHSP2332074100EC/0002

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I. EXECUTIVE SUMMARY

A. New Opportunities, New Responsibilities

On February 17, 2009, President Obama signed into law the American Recovery and Reinvestment Act (ARRA) and, in doing so, committed significant resources to expand health information technology (IT) adoption and the secure and effective exchange of health information.

Within this new health IT agenda, states will play a pivotal role in creating and implementing plans, directing resources, and ensuring the investments yield improvements in the quality, safety and efficiency of health care. The health IT provisions of the ARRA will establish new accountability requirements, generate new reimbursement incentives, create new technical assistance centers, and introduce new collaborative arrangements that will require states to align resources, manage implementation, and coordinate activities amidst an array of new programs and obligations.

To ensure resources are effectively and efficiently deployed, states will need comprehensive strategies that take into account the complex challenges of advancing interoperability and serve the collective needs of all stakeholders.

B. Building upon Current State-level HIE Efforts

States have played an important role in aligning health IT and health information exchange (HIE) development with health policy goals. In nearly three-quarters of states, stakeholders in the public and private sectors have organized state-level HIE initiatives to foster collaboration in the public interest, coordinate activities and optimize resource allocation, and create the required accountability, policy, and technical frameworks to sustain their HIE development efforts.¹

While “states” include a broad array of stakeholders, institutions, populations and sectors within geopolitical borders, often the term “state” is used to refer to the actions of state government. Here, “state-level” is being used to reference the broad range of HIE roles, functions, issues and strategies that include state government participation but involve more broad public-private activities and collaboration. State governments play key roles as part of the state-level HIE efforts that are occurring; however, states vary as to how and where certain state-level HIE roles and activities are led and/or hosted e.g. within or outside of state government versus private sector. In any case, *state-level* refers to a set of distinct collaborative, public and private sector efforts for achieving *statewide* HIE that address:

- *Social capital and stakeholder consensus*: pragmatic solutions
- *Priorities*: HIE, health care reform targets, stakeholder value propositions
- *Investments and activities* (planning and implementation)
- *Infrastructure*: governance, technology, policy, HIE services, business model/ financing
- *Links*: Addressing needs and barriers (local and statewide)

¹ American Health Information Management Association. “State-level HIE Value and Sustainability Approaches for Financing and Bringing Interoperability to Scale.” November 5, 2008. Available online at <http://www.slhie.org/Docs/StateLevelHIEValueandSustainability.pdf>.

As the breadth and intensity of state-level HIE efforts have steadily increased, so too have efforts to assist stakeholders plan, align resources, and develop effective implementation strategies. The State-level HIE Consensus Project (Project) was created in 2006 to study, assess, and provide recommendations to support development of effective state-level HIE considering the intersection of local, state and nationwide efforts.² For the last three years, the Project has studied and reported on the opportunities, key issues, and challenges for planning, implementing and evaluating HIE efforts. During 2008, the Project launched the Leadership Forum (Forum) to seek to engage all state-level HIE initiatives and share research results and lessons learned in an effective and timely manner.

Two other projects have been instrumental in assisting states, especially state government, to understand the HIE roles and relationships emerging. The State Alliance for e-Health, sponsored by the National Governors Association, has developed a series of valuable reports and recommendations regarding the complex and multi-faceted roles for state government vis-à-vis health IT and HIE.³

In addition, the National Conference for State Legislatures, through its Health IT Champions or HITCh effort, has maintained a database of State health IT legislation and State health IT Executive Orders, and synthesized information regarding prevailing state health policy trends related to fostering health IT and HIE best practices.⁴

Given the opportunities, obligations and timeframes posed by new federal law, the Project responded to assist the Forum and state-level HIE leaders in the near term as they consider comprehensive strategies to align health IT and HIE plans with a sustainable, high performing health system. This is one of several targeted analyses completed during the first quarter of 2009 to address topics identified by the Project's Steering Committee and Forum as key priorities.

This brief distills a key set of information about prevailing state-level HIE approaches, stages of development and planning and implementation issues as state-level HIE leaders strive to develop strategic next steps for their statewide HIE progress. This report synthesizes information from three major sources: (1) the Project's existing field research and three year body of findings on the critical governance, policy, technical, and financing issues for state-level HIEs; (2) in-depth key informant interviews conducted with representatives from a select number of states (9) in March 2009; and (3) feedback from the Project Steering Committee and Forum.⁵

C. Key Findings For Bringing Interoperability To Scale

This analysis points to three overriding strategic priorities critical for the success of state-level HIE efforts across stages of development.

² Additional information, reports, and resources are available online at <http://www.slhie.org/>.

³ Additional information on the State Alliance for e-Health is available online at <http://www.nga.org/center/ehealth>.

⁴ Additional information on the HITCh is available online at <http://www.hitchampions.org/>.

⁵ The list of informants is provided in *Attachment 2*.

Aligning Health IT and HIE Efforts to Support Health System Improvement

While technology can introduce new and powerful tools to improve healthcare, the deployment of health IT and the development of interoperable systems alone will not guarantee better, safer, more cost effective, accessible healthcare.

Health IT and HIE strategies are simply means to an end and must be guided by and framed within the context of specific healthcare objectives. As stated by incoming National Coordinator for Health IT, Dr. David Blumenthal, in a recent article in the *New England Journal of Medicine*, “[health IT] – computers, software, Internet connection, telemedicine- [should be seen] not as an ends in itself but as a means of improving the quality of healthcare, the health of populations, and the efficiency of healthcare systems.”⁶

The Project’s research efforts have consistently pointed to a link between quality improvement and HIE; based on the experiences and lessons learned from HIE development efforts, achieving widespread interoperability is a prerequisite in order to transform health care to deliver improved quality and cost-effectiveness. States with explicit and strong commitments to leverage HIE as part of their broader health care agendas have had the most success to date in financing and implementing state-level HIE initiatives.⁷

State-level HIE leaders report that the ARRA provides them with a unique opportunity to develop new, or refine their existing, comprehensive, statewide interoperability plans to address health IT adoption strategies. They assert that despite variation in strategies that may be deployed across states, any efforts to expand both provider adoption of health IT and information exchange must be linked to achieving common goals and priorities and part of a comprehensive and statewide healthcare improvement strategy.

Creating Mechanisms for Real Public-Private Collaboration

There are distinct and critical functions that have been categorized and described as the state-level HIE role of governance: these are convening and coordinating activities that are carried out by an organized body with a specific charter to guide statewide HIE development. The Project’s findings indicate that state-level HIE governance is a role that must address the diverse, dynamic and often divergent needs of local stakeholders yet also align statewide strategies with directions under the national strategic plan for health IT.⁸

Achieving HIE implementation to meet healthcare improvement goals requires an effective structure for sustained collaboration and coordination across sectors and among diverse stakeholders. This collaborative structure provides a critical piece of infrastructure – a mechanism for negotiating health IT and HIE solutions among diverse interests (e.g., providers, payers, purchasers, researchers, consumers, policy makers) taking into account pragmatic

⁶ Blumenthal, David, MD. “Stimulating the Adoption of Health Information Technology.” *New England Journal of Medicine*. March 25, 2009. Available online at <http://content.nejm.org/cgi/content/full/NEJMp0901592>.

⁷ American Health Information Management Association. “State-level HIE Value and Sustainability Approaches for Financing and Bringing Interoperability to Scale.” November 5, 2008.

⁸ The ARRA calls for funding and programs to be tied to the “strategic plan developed by the National Coordinator.” The current version of the National Coordinator’s strategic plan, “The ONC-Coordinated Federal Health Information Technology Strategic Plan 2008-2012” is available online at <http://www.hhs.gov/healthit/resources/HITStrategicPlan.pdf>.

implementation challenges, and balancing these against the public interest in health system improvements. This is a new and challenging role to achieve in practice; it requires operationalizing an effective public-private partnership structure to address financing, technical approach, data exchange policies, communication and education. The state-level HIE governance entity must have the resources, authority and social capital to develop an effective collaborative HIE governance framework, necessary to ensure consistent policy, technical, and financial approaches to advance interoperability.

Planning for Sustainability

For many, the magnitude of funding from the ARRA has created the impression that the financial obstacles for health IT have been resolved. While the funds represent an unprecedented investment, they will not address the persistent challenges to sustaining a health information infrastructure that meets the demands of a high performing healthcare system.

As stakeholders begin the process of creating or updating their statewide plans, it will be critical to avoid the temptation of addressing short term financial needs at the expense of the longer term systemic considerations that will ultimately determine the success of the stimulus investment. States need to act now and engage public and private payers and purchasers in a dialogue to develop the financial mechanisms needed to ensure the long term viability of these efforts.

II. EVOLUTION OF STATE-LEVEL HIE EFFORTS

A. Unique Contributions of State-level HIEs

Fueled by increasing evidence about the impacts of fragmented, inadequate information on healthcare quality, safety and costs, the ARRA provides a foundation for healthcare reform efforts by accelerating the transition of the nation's health records from paper to electronic format and ensuring that health information can be readily exchanged securely, accurately and in a timely fashion via interoperable electronic health networks.

Despite the evidence of its value in improving the quality, safety, effectiveness, and efficiency in care, HIE has grown slowly and has been primarily organized to meet the immediate interests and near-term operational requirements of a limited set of stakeholders.⁹ The most advanced and sustained clinical HIE efforts have been around the transactional needs of data providers by supporting the automated exchange of clinical results between hospitals, physicians, and laboratories. A 2008 survey by the eHealth Initiative found that 26 of the 42 operational HIEs offered clinical messaging, results delivery, or clinical documentation as one of their services.¹⁰

These "private exchanges," where organizations with defined business relationships share information to address internal needs, are proliferating as healthcare organizations expand their IT capabilities for strategic advantage and marketplace differentiation vis-à-vis their competitors. Though keenly attentive to their paying customers' priorities, the private exchanges aren't designed to address the objectives of the broader health care community. Not surprisingly, the

⁹ Glaser, John, "The Advent of RHIO 2.0," *Journal of Health Information Management*. Summer, 2007.

¹⁰ eHealth Initiative. "Results of 2008 Survey on Health Information Exchange." Accessed online at <http://ehealthinitiative.org/HIESurvey/2008PrimaryFocus.msp#1> on March 28, 2009.

eHealth Initiative's 2008 survey found that only 10 of the 42 operational initiatives offered disease or chronic care management services, eight offered quality improvement reporting for clinicians, and six offered public health reporting.

Recognizing the potential for creating a shared infrastructure that meets the collective needs of all stakeholders, state-level HIE initiatives are advancing interoperable HIE.¹¹ Since the launch of the first state-level HIE effort, the Utah Health Information Network (UHIN) in June 1993, states across the country have been working to solidify collaborative governance and accountability frameworks and address the fundamental policy, technical and financing challenges to advancing interoperability. Today, organized state-level HIE efforts are in various stages of operations in forty-nine states.¹²

Serving as a bridge between the public and private sectors, state-level HIE efforts offer distinct and important contributions to advance the interoperable exchange of health information:

- Ensure that exchange develops beyond narrowly-defined interests to serve statewide public interests;
- Identify the boundaries for cooperation and competition.
- Mobilize public and private resources for effective collaboration.;
- Create opportunities for cost-effective, shared investments across stakeholders.;
- Serve state public policy interest and consumer protection concerns by facilitating consistent, reliable HIE practices.

B. State-level HIE Roles and Functions

States vary, characterized by distinct populations, geographic boundaries, government organization, policies, economies and marketplace dynamics, and cultural norms for how things get done.

Despite these variations, at the state level, stakeholders share common interests and a need for a collective framework to develop, implement and assess health, healthcare and healthcare reform. In support of a statewide organizing capacity, state-level HIE entities serve two important and distinct roles:¹³

¹¹ These efforts highlight an important distinction between “states” and “state-level HIE.” The term “states” refers to the roles and responsibilities of state government including health care policy, regulation and oversight, public health, and public insurance programs. “State-level HIE” refers to efforts involving public and private stakeholders that serve as the locus for organization, planning, and implementation of statewide interoperability efforts.

¹² American Health Information Management Association. “State-level HIE Value and Sustainability Approaches for Financing and Bringing Interoperability to Scale.” November 5, 2008.

¹³ American Health Information Management Association. “State Level Health Information Exchange: Roles in Ensuring Governance and Advancing Interoperability Final Report Part I.” March 10, 2008. Available online at <http://www.slhie.org/Docs/FinalReportPart1.8.pdf>.

- **Governance:** A primary role to convene health care stakeholders, promote collaboration, develop consensus, coordinate policies and procedures to secure data sharing, and lead and oversee statewide HIE.
- **Technical operations:** An optional and variable role to manage and operate the technical infrastructure, services, and/or applications to support statewide HIE.

The table below identifies the functions and core tasks across the governance and technical operator roles.

Categorization of State-Level HIE Organizational Roles and Functions

Role	Governance		Technical Operations
Function	<i>Convene</i>	<i>Coordinate</i>	<i>Operate/Manage</i>
Task	<ul style="list-style-type: none"> • Provide neutral forum for all stakeholders • Educate constituents & inform HIE policy deliberations • Advocate for statewide HIE • Serve as an information resource for local HIE and health IT activities • Track/assess national HIE and health IT efforts • Facilitate consumer input 	<ul style="list-style-type: none"> • Develop and lead plan for implementation of statewide solutions for interoperability. • Promote consistency and effectiveness of statewide HIE policies and practices • Support integration of HIE efforts with other healthcare goals, objectives, & initiatives • Facilitate alignment of statewide, interstate, & national HIE strategies 	<ul style="list-style-type: none"> • Serve as central hub for statewide or national data sources and shared services • Own or contract with vendor(s) for the hardware, software, and/or services to conduct HIE • Provide administrative support & serve as a technical resource to local HIE efforts

Among the governance coordination tasks, the creation and maintenance of a plan that delineates and prioritizes the development of the statewide HIE activity is perceived as a top priority.

III. CONSIDERATIONS FOR STATE-LEVEL HIE PLANNING AND IMPLEMENTATION

Developing and sustaining efforts to bring interoperability statewide requires state-level HIEs to address an array of interrelated issues that comprise a statewide HIE infrastructure, including:

- Governance and Accountability
- Health System Improvement Goals and Priorities
- Privacy and Security Policies
- Financing (Governance and HIE Related Services)
- Technical Design

- Health IT Adoption

Previous field research demonstrated that states address these issues incrementally through a series of iterative steps ranging from formative and foundational activities to more advanced implementation and operational stages.¹⁴ Typically, state-level HIE efforts begin with the articulation of a broad vision and then proceed through a continuous cycle of planning, execution, evaluation, and plan modification simultaneously across all the threshold issues.

The non-linear progression of state-level HIE efforts makes it challenging to develop precise distinctions or “bright lines” between stages. While the Project continues to study the interplay between and optimal sequencing of tasks, consensus is emerging on the key milestones that distinguish a State’s preparatory planning activities and the first steps of implementation. The table below highlights the key milestones between “planning” and “implementation.”

Milestones for State-level HIE Infrastructure Development

	Planning Milestones	Implementation Milestones
Governance	<ul style="list-style-type: none"> - A framework that defines the relationships and accountability among the stakeholders is created. - A qualified State-designated entity or State government advisory entity being created to lead statewide efforts. 	<ul style="list-style-type: none"> - Qualified State-designated entity incorporated <u>or</u> State government entity empowered with governance role launched and fully staffed.
Health System Improvement	<ul style="list-style-type: none"> - Establish the health improvement goals and identify the use cases required to achieve goals. 	<ul style="list-style-type: none"> - Data exchange in support of identified use cases has begun.
Privacy and Security Policies	<ul style="list-style-type: none"> - Initial assessment of threshold privacy and security issues launched. 	<ul style="list-style-type: none"> - Threshold privacy and security issues being addressed and statewide policies in development.
Financing	<ul style="list-style-type: none"> - Development of a business plan supported by the majority of the health care entities and HIE stakeholders - Funding for convening & coordinating elements <i>secured</i> - Funding for development of statewide HIE infrastructure and/or pilot projects <i>identified</i>. 	<ul style="list-style-type: none"> - Implementation proceeding according to business plan and tied to a business model leading to sustainability - Funding for statewide HIE technical infrastructure and/or pilot projects <i>secured</i>.

¹⁴ American Health Information Management Association. “State-level HIE Value and Sustainability Approaches for Financing and Bringing Interoperability to Scale.” November 5, 2008.

	Planning Milestones	Implementation Milestones
Technical Design	<ul style="list-style-type: none"> - Stakeholders agree on technical design and approach, selection and sequencing of use cases. - RFP(s) for technical implementation released. 	<ul style="list-style-type: none"> - Vendor selected, contract signed and development underway. - Components of statewide HIE technical infrastructure in development. - Pilots projects launched and operational.
Health IT Adoption	<ul style="list-style-type: none"> - Levels of health IT adoption across various care settings have been measured and gaps identified. - Strategies, mechanisms and programs to address health IT adoption gaps have been developed and designed. 	<ul style="list-style-type: none"> - Mechanisms and programs to address health IT adoption gaps are operational and funding and resources have been committed to accelerate adoption.

Additional information on the scope of each of the key issues, states’ approaches to addressing the issues, and new considerations in light of the opportunities and obligations posed by the ARRA are provided below.

A. Governance

Project findings confirm that stakeholders need and expect state-level HIE efforts to create and sustain a trusted, transparent, independent, and collaborative platform for education, negotiation, and decision making among diverse stakeholders. As state-level HIE initiatives mature, governance typically evolves from the foundational tasks of engaging stakeholders and designing a collaborative process to the essential, operational activities of creating and enforcing the agreed upon statewide policies and practices.

In March 2008, the Project identified and advanced three recommendations to facilitate and support implementation of state-level HIE governance roles and functions.¹⁵

1. State government and healthcare stakeholders should support and participate in a single, state-level entity organized as a public-private partnership that takes on a distinct state-level HIE governance role.
2. State governments (e.g., governors, legislators, agencies) should take appropriate steps to recognize a statewide HIE governance entity; provide funding; structure its authority to enable it to receive particular types of benefits, financial and otherwise; and define its accountabilities related to state policy goals and related statutory requirements.
3. State governments should designate a point of coordination across government agencies and public programs that will be responsible for working in concert with the state-level HIE governance organization to advance the state’s HIE implementation road map and help promote coordinated public-sector HIE policy development.

¹⁵ American Health Information Management Association. “State Level Health Information Exchange: Roles in Ensuring Governance and Advancing Interoperability Final Report Part I.” March 10, 2008.

Recent State Alliance for e-Health sponsored research addressed options for how state governments can ensure accountability and effectively participate in overseeing statewide HIE. Three proposed models of HIE governance were examined.¹⁶ Differing primarily based on the nature and extent of state government oversight, the three conceptual models include:

- **Government-Led HIE:** State governments provide or manage the HIE technical infrastructure and oversee its use.
- **HIE Public Utility with Strong Government Oversight:** State government serves an oversight role and regulates statewide HIE that is provided by the private sector.
- **Private-Sector-led HIE with Government Collaboration:** State government collaborates and contributes as a stakeholder in the private-sector provision of HIE, relying on self-regulation mechanisms like accreditation in concert with statutory and regulatory frameworks.

The Project's work points to emerging state level HIE efforts that are examples of each of these models with growing attention being paid to how roles and organizational structures and accountabilities will best be formalized, especially in the context of the new federal HIT law and framework.

State Approaches to Advance Effective Governance

Despite the variation in governance models, states face four common tasks related to governance as they develop their statewide plans: (1) developing and sustaining stakeholder buy-in; (2) coordinating efforts across stakeholders, (3) determining resource allocation including which entity will serve as the primary fiscal agent for federal stimulus funding; and (4) defining mechanisms for accountability.

1. Stakeholder Buy-in. Ensuring a meaningful framework for public-private sector coordination depends to a large extent on the types of entities that participate in the decision-making process and the mechanisms for securing and sustaining their commitment.

To a significant extent, most state-level HIE planning and governance activities include the groups of stakeholders that ARRA mandates must be consulted when developing and implementing a state's HIE plan. The ARRA calls for States or qualified State-designated entities to consult with the following types of organizations:

- 1) Healthcare providers (including providers that provide services to low income and underserved populations)
- 2) Health plans
- 3) Patient or consumer organizations that represent the population to be served
- 4) Health information technology vendors
- 5) Healthcare purchasers and employers
- 6) Public health agencies

¹⁶ State Alliance for E-Health. "Public Governance Models for a Sustainable Health Information Exchange Industry." February 2009. Available online at <http://www.nga.org/Files/pdf/0902EHEALTHHIEREPORT.PDF>.

- 7) Health professions schools, universities and colleges
- 8) Clinical researchers
- 9) Other users of health IT such as the support and clerical staff of providers and others involved in the care and care coordination of patients

Previous research, as well as interviewees' recent responses about which stakeholders should be consulted or otherwise included in statewide HIE activities, emphasize the lack of a one-size-fits-all approach and the consequent need for flexibility and for tailoring stakeholder representation so that it reflects a state's unique healthcare market.

Leaders of state-level HIE initiatives who have had experience in convening and coordinating stakeholders to drive governance processes insist that careful consideration and inclusion of the right mix of stakeholders is of critical importance to any statewide HIE initiative. Failure to choose the correct group of participants to lead HIE activities can hamper, if not completely derail, a fledgling effort.

Further, state-level HIE representatives have consistently emphasized that the guiding principle should not be quantity of stakeholders, but instead the inclusion of a balance of key stakeholders – it is the “quality” of the participants that can bring credible stakeholder perspectives and valuable insights to the governance process. Including the right balance of participants can also facilitate stakeholder buy-in and can preempt differences that may later arise due to competing stakeholder interests.

“My advice to other states that have not created a state plan is that it is incredibly important to have the right people at the table when developing your State's HIE strategy. There is a fine line between the inclusion of all stakeholders that absolutely must be at the table in order to be successful, and including every single entity that might have some interest. I would recommend being very thoughtful and careful that you have the right people involved when developing the plan – that you invite people that are actually using these systems or will be using these systems or will be directly involved in HIE.”

Though not called out in the above stakeholder list, some of the state-level HIE representatives also found the following stakeholder groups to be valuable contributors to statewide planning efforts: pharmacies and pharmacists, representatives from the State Legislature, mental health providers, and long-term care providers.

In some states, representatives of particular stakeholder groups (such as regional health information organizations, vendors, consumer advocacy organizations, etc.) were not members of the state-level HIE board, but were included in the statewide process via mechanisms such as committees, workgroups, advisory groups, or separate associations.

Engaging consumers and helping them understand and use health IT remains an important, but challenging task. Below are examples of approaches to states have taken to ensure consumers participate, guide, and benefit from these efforts.

- In the State of Washington, the entire statewide HIE effort is calibrated around patient empowerment. To this end, the State has created a web site AccessMyHealth.org. The

initiative grew out of a Health Care Authority committee charged with finding methods and educational approaches to activate and engage consumers and providers in the use of online PHRs in conjunction with, and in order to support, the state's ongoing health record banking demonstration projects.

- In New York, as in many states, the statewide collaborative process includes an advisory body for consumer engagement and education on e-health called the Consumer Advisory Council.¹⁷
- In Florida, the State is expanding awareness and consumer adoption of health IT by developing a pre-natal PHR as part of the Medicaid program. Through this program, pregnant women receiving Medicaid benefits would be eligible to sign up for a “baby book” which would be populated directly by claims-based data from Medicaid, as well as with additional information entered directly into the PHR by the expectant mother. The “baby book” would serve as a mechanism for helping the participant to manage her prenatal care, through prenatal care appointment reminders and patient education materials. Once the baby is born, the PHR would instead present baby wellness care and immunization reminders, appointment scheduling reminders, and clinical care information.
- In Minnesota, the state-level HIE initiative is working with various consumer, provider, and payer associations to develop materials describing and explaining the statewide HIE effort that can be included in their member newsletters.

2. Statewide Coordination. As part of their governance roles, state-level HIE entities provide coordinating functions that help identify common needs, optimize resource allocation, and ensure stakeholders have the resources they need to implement and use health IT effectively.

In the context of the ARRA, the task of coordination is made more challenging. Funding from ARRA will come from a wide range of federal departments spanning multiple existing and new programs. Moreover, funding recipients will span multiple state agencies and offices, individual provider and care settings, and many important new entities that remain to be defined.¹⁸

Whether housed within state government and supported by public-private advisory bodies or led by independent public-private partnerships, advanced state-level HIEs have structured their public-private collaborative process around functional workgroups to advance the objectives related to their statewide plans.¹⁹

In 2006, Tennessee Governor Phil Bredesen issued Executive Order #35 to establish the eHealth Advisory Council. The Council includes representatives of the Tennessee provider community, employers, regional healthcare information organizations, payers and consumer groups from across the State of Tennessee. The primary goal of the eHealth Advisory Council is to develop and implement an overall strategy for the adoption of EHRs by creating a plan to promote their

¹⁷ Additional details on the Consumer Advisory Council is online at <http://www.nyehealth.org/consumer-advocacy>.

¹⁸ *Attachment 3* provides an illustration of the magnitude and complexity of the forthcoming federal funding.

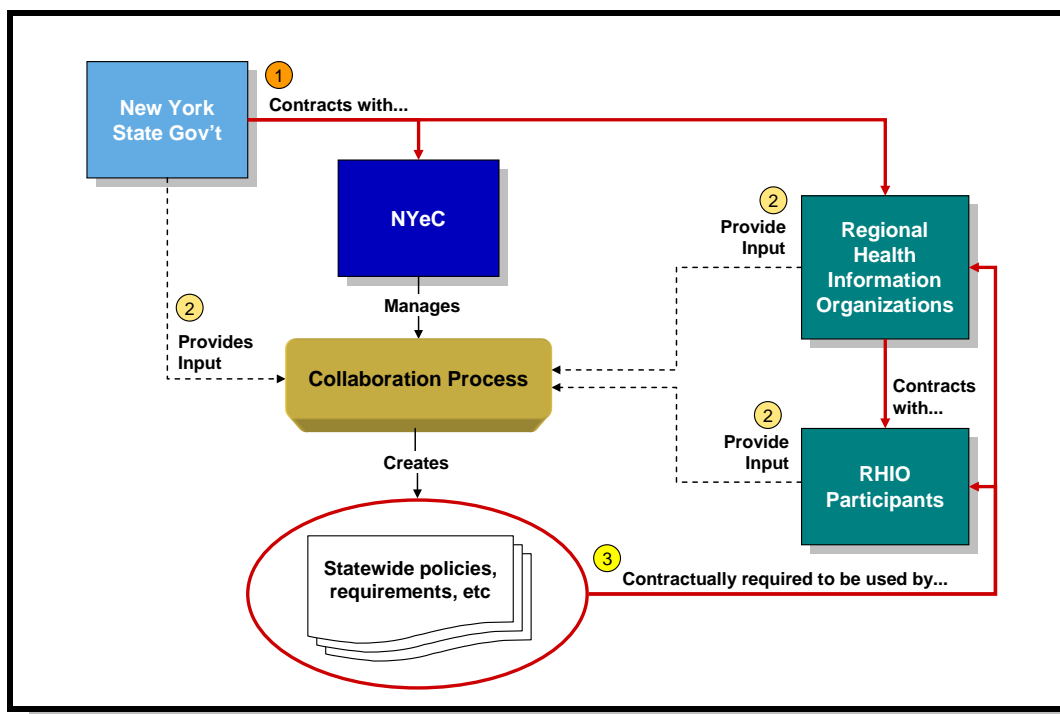
¹⁹ An overview of statewide coordination approaches and workgroups is provided in *Attachment 4*.

use by all healthcare stakeholders at the point of care. The eHealth Advisory Council’s initial efforts were directed toward building the legal framework to forge trust and establish rules of engagement for HIE in Tennessee.

In New York, the New York eHealth Collaborative (NYeC) is facilitating the Statewide Collaboration Process comprised of the New York State Department of Health, Regional Health Information Organizations (RHIOs) that have received state contracts, and other stakeholders to collaboratively develop the common policies, standards, technical approaches and services for New York’s health information infrastructure as an underpinning to a value-oriented, high-performing healthcare system.²⁰

The Statewide Collaboration Process is a transparent and consensus-driven decision-making process supported by workgroups that recommend policies, standards, technical approaches, and services to the NYeC Policy and Operations Council, the NYeC Board and the Department of Health. The figure on the following page illustrates the relationships and policy creation and enforcement flows.

Illustration of Statewide HIE Accountability Framework in New York



While coordination across the public and private sectors can be difficult, the task within state government is no less challenging. In each state, there exist multiple, discrete agency-sponsored or managed systems (e.g., disease, immunization, newborn screening registries; public health systems; Medicaid Management Information Systems) that have been developed with specific

²⁰ Additional details on New York’s statewide collaborative approach can be found online at <http://www.nyehealth.org/policy-operations-council>.

purposes, funded through categorical programs, and aren't configured to support the exchange of data with other systems.

As noted above, ARRA has only increased the importance of state government coordination by creating both a need and an opportunity for state agencies to work in concert to advance HIE in the state.

In order to avoid exacerbating the fragmentation of the multiple systems, many states are convening the leadership of the departments that pay for, provide, and regulate healthcare to develop a comprehensive framework that would allow the systems to interoperate with each other as well as the private and non-profit sectors.²¹ In addition, a number of states have charged their State agency that initially incubated statewide HIE efforts to assume the lead in developing a coordinating approach across relevant state agencies. In the case of Tennessee, all State Government Agencies who purchase medical/mental health-related professional, pharmaceutical, laboratory, or imaging type services must gain the endorsement of the Office of e-Health Initiatives before submitting contracts/grants for State approval.

The new health IT stimulus bill presents particularly unique opportunities and challenges for state Medicaid Agencies. During interviews with state-level HIE leaders, the health IT stimulus incentives that will flow to providers through state Medicaid were frequently cited as the most compelling reason for a renewed interest in close coordination between HIE planning and implementation activities and the state's Medicaid agency.

Numerous studies highlight the financial, technical and operational considerations for integrating Medicaid efforts within the context of statewide HIE.²² A handful of states that were awarded Medicaid Transformation Grants to fund HIE initiatives (e.g., Arizona, Connecticut, Kentucky, Rhode Island, Michigan, West Virginia) have experience in coordinating activities across the state-level HIE and the state's Medicaid agency. In addition, Florida's Center for Health Information and Policy Analysis, the state's lead organization for state-level HIE, has worked closely with the Florida Medicaid program to implement a Medicaid e-prescribing pilot project and to design their forthcoming claims-based Medicaid EHR.

3. Choice of Entity to Oversee Use of Stimulus Funding. State-level HIE initiatives range in form across states; some are housed within state government and supported by public-private advisory bodies, while others are independent public-private partnerships that have been incorporated as non-profit. Over the course of the Project's three years of research, Project participants have actively shared their experiences and discussed the merits and challenges inherent in various approaches to accomplishing state-level HIE goals. They acknowledge the successes of some key state-level HIE initiatives currently hosted within state governments, but also recognize the long term challenges for sustaining effective state-government led state-level HIE activities such as the example of today's economic climate and impact on state budgets. Many state-level HIE

²¹ Multiple respondents interviewed for this study noted that their statewide HIE discussions have been broadened beyond Medicaid and public health agencies to include departments in charge of correctional and mental health facilities, and offices in charge of overseeing their states' Federal Communications Commission's Rural Healthcare Broadband Program.

²² Additional information on Medicaid's relationship vis-à-vis statewide HIE efforts will be available in a forthcoming Project report.

leaders perceive that even in states where government currently plays a key sponsorship role for early HIE efforts, over time it will be most valuable for a state-level HIE entity to be a structure that engages, but sits outside of, state government.²³

The ARRA specifies that the State Grants to Promote Health IT may award funding to either a State or qualified State-designated entity. The ARRA states that a qualified State-designated entity will:

- (1) be designated by the State as eligible to receive awards;
- (2) be a not-for-profit entity with broad stakeholder representation on its governing board;
- (3) demonstrate that one of its principal goals is to use information technology to improve health care quality and efficiency through the authorized and secure electronic exchange and use of health information;
- (4) adopt nondiscrimination and conflict of interest policies that demonstrate a commitment to open, fair, and nondiscriminatory participation by stakeholders; and
- (5) conform to such other requirements as the Secretary may establish.

The parameters of the State Grant Program have yet to be determined. However, stakeholders are assessing the feasibility of various options within their state for the fiscal agent that will oversee the allocation of possible State Grant Program funding. They are weighing the perceived advantages of either qualified State-designated entities and/or state governments to play the role of fiscal agent.

A number of respondents from both state agencies and independent public-private state-level HIE entities noted that a qualified State-designated entity offered the following advantages:

1. **Staffing and Expertise.** In the wake of the economic downturn, many states have imposed hiring freezes, mandatory staff reductions, and limitations on new contracting. As a result of these measures, some state agencies may have difficulties acquiring the specialized skill sets to address the range of anticipated health IT and HIE projects. On the other hand, qualified State-designated entities often possess or have the flexibility to obtain the required personnel and resources.
2. **Procurement Process Efficiency.** In some states, independent entities have more flexible and efficient procurement processes than State government.
3. **Competing Financial Interests.** Many states currently face dramatic budget shortfalls and a broad range of programs in need of financial support; these dire fiscal circumstances and competing financial interests may negatively impact the amount of funds available to directly support HIE activities. One respondent explained it by saying: “Times are so tough right now that we fear it might be really tempting for the State to siphon some of that money towards other things that are less directly tied to HIE or

²³ American Health Information Management Association. “State Level Health Information Exchange: Roles in Ensuring Governance and Advancing Interoperability Final Report Part I.” March 10, 2008. Available online at <http://www.slhie.org/Docs/FinalReportPart1.8.pdf>.

toward overhead costs/cost of administration, and this could make a difference for the funds that are available for state coordination and HIE activities.”

4. ***Balanced Inputs to Ensure Sustainability.*** By virtue of its public-private nature, independent entities can often blend the diverse interests of a broad base of stakeholders. While State government can achieve structured input, if all authority and fiduciary responsibilities lie with the State, some stakeholders may feel the process lacks a meaningful mechanism to participate in the decision-making process.
5. ***Incubation from Political Changes.*** Some states have already encountered the changes in e-health programs that may occur due to a change in state administration, such as a change in governor. In this budget climate, budget priorities for new administrations may override the perceived need for new or expanded e-health programs. While not immune from political influence, most independent state-level entities can be structured so as to be relatively insulated to ensure its efforts survive changes in administration.
6. ***Securing Matching funds.*** State-designated entities will be able to access funds from a variety of sources—private and public—to meet matching funds requirements of many of the proposed ARRA programs. State governments may be prohibited by their constitutions or laws from accepting private sector contributions towards matching funds.

While stakeholders have consistently emphasized that statewide interoperability must be led by a public-private partnership, some believe state government to be better suited as the fiscal agent for the State Grant Program for the reasons cited below.

1. ***A Qualified Independent State-designated Entity Doesn't Currently Exist.*** Many states lack a candidate to serve as a qualified State-designated entity, and accordingly, state government would have to serve as the fiscal agent.
2. ***Qualified State-designated Entity Exists, But Lacks Capabilities to Administer Funds.*** Some respondents indicated that the qualified entities in their state currently lack the capacity to assume responsibility for the amount of funding and federal accountability requirements that would accompany funding under the State Grant Program.
3. ***Qualified State-designated Entity Exists, But Lacks Purview to Address the Full Range of Requirements.*** A few respondents indicated that the existing qualified entity did not have the scope to address or support the range of activities and eligible uses of funds called for in the State Grant Program. For example, in order to ensure that state agencies like Public Health, Corrections, Medicaid and CHIP can exchange data through the emerging statewide infrastructure of shared services, state government may be better suited to oversee and manage agencies' internal system updates.
4. ***Defining Accountability.*** States, acting primarily through the agencies of state government, have three principal means to protect the public's interests and ensure accountability of HIEs in the state: (1) direct oversight through legislation or regulation of entities, (2) contracts with specific entities, and/or (3) indirect oversight in which the state designates or confers authority to

another organization (e.g., an accreditation body) to develop and manage the evaluation of entities in an industry.²⁴

- **Legislation and Regulation:** Studies of accountability mechanisms suggest that legislation or regulation works best in circumstances where participants are vulnerable and require strong consumer protection, and where the industry lacks a dominant professional group with its own mechanisms for professional discipline and a choice of suppliers, which limits the effectiveness of market forces in ensuring quality.²⁵ While many contend that direct oversight is the preferred vehicle for certain aspects of HIE, especially privacy and security, others argue that governments are better at developing regulations and guidelines than tracking or measuring them.²⁶ Critics also note that rules can be difficult to update once codified in laws or regulation. Legislation, which is subject to the political process, can be even more challenging to adapt.
- **Contracting:** If projects are supported with public funding, state government can use contracts to ensure that state funds are used in a way that promotes the policy goals and protects the public's interest. As an accountability mechanism, contractual authority affords the state direct oversight and does not require the creation of new external authorities and processes. Moreover, the contractual terms bind only entities that receive grant funds and would be difficult to use for other entities that may want to participate in the statewide HIE.
- **Accreditation:** In contrast to regulation and contracting, accreditation has the potential to be more adaptive to market needs. Through research and staying abreast of activities within their profession, accreditation organizations seek to promote use of best practices and continuous process improvement for the entities they accredit. Accreditation organizations also aim to maintain flexibility in program structure to support innovation as a market evolves. For example, organizations will often specify standards that accredited entities must meet, but will not mandate the means by which an accredited entity must meet them so that innovative practices are given room to develop. On the other hand, critics of accreditation argue that accreditation lacks the sanctioning strength of government and can be too closely aligned with the industry it evaluates.²⁷

The use of accreditation as a government oversight mechanism presupposes the existence of a qualified private organization that can effectively serve the government's interests. While no organizations currently accredit HIEs or Regional Health Information

²⁴ For additional details on accountability models and options, please see the State Alliance for E-Health's report "Public Governance Models for a Sustainable Health Information Exchange Industry."

²⁵ Eleanor D. Kinney, "Private Accreditation As A Substitute For Direct Government Regulation In Public Health Insurance Programs: When Is It Appropriate?" *57 Law and Contemporary Problems*, 47, 51. 1994.

²⁶ Institute of Medicine. *Improving the Quality of Long-Term Care*. 2001.

²⁷ For additional information on the role and implications of accreditation, please see the New York eHealth Collaborative's "RHIO Accreditation White Paper: Interoperable Health Information Exchange Policy, Governance, and Accountability." September 2008. Available online at http://www.nyehealth.org/files/File_Repository16/pdf/NY_RHIO_Accred_Paper.pdf.

Organizations (RHIOs), a number of accreditation bodies are exploring options for creating an accreditation framework for entities that support HIE.²⁸

B. Health System Improvement

States have significant influence over health care system performance as regulators of insurers and medical providers and as purchasers of health care. They can use these levers to establish expectations, gather and analyze information needed to identify quality problems and their causes, and require, encourage and reward provider efforts to improve quality and patient safety.

States have many opportunities to improve quality and patient safety and safeguard the public. They can encourage transparency through public reporting to drive quality improvement, reward high quality and safe performance, encourage correction of poor performance through purchasing decisions, and coordinate with other state agencies and partner with the private sector on quality initiatives.²⁹

Throughout the course of the Project, stakeholders have defined health IT and HIE as means to an end that must be guided by and framed within the context of specific healthcare objectives. Based on previous research, there appears to be widespread recognition that state-level HIE efforts need to be calibrated to health system improvement. In 2007, the Project conducted a detailed assessment of publicly available mission and vision statements from 21 state-level HIEs initiatives. Among the principles included in the surveyed state plans, the Project found that establishing goals related to quality and value are most frequently cited.³⁰ The table below highlights the Project’s findings.

State Level HIE Goals related to Health Care System Improvement

Principles	Percent of States including the principle	Examples
1. Establish clinical goals of quality and value as highest priority	76%	<i>Rhode Island Quality Institute:</i> The Quality Institute will promote coordination and collaborative relationships, increase value to purchasers and improve the overall <u>quality</u> and <u>safety</u> of healthcare in Rhode Island.
2. Emphasize the critical role of interoperability	76%	<i>The Kentucky e-Health Network Board:</i> ...champion the development of a secure, <u>interoperable</u> electronic health network...
3. Recognize the need for multi-stakeholder participation	71%	<i>Delaware Health Information Network:</i> To facilitate the design and implementation of an integrated, statewide health data system to support the information needs of <u>consumers, health plans, policymakers, providers, purchasers and research...</u>

²⁸ The Electronic Healthcare Network Accreditation Commission is developing a new program to accredit clinical health information exchanges.

²⁹ National Academy for State Health Policy. “State Health Policies Aimed at Promoting Excellent Systems: A Report on States’ Roles in Health Systems Performance.” April 2008. Available online at http://www.nashp.org/Files/shapes_report.pdf.

³⁰ American Health Information Management Association Foundation of Research and Education. “Workbook of Interim Findings: Building Sustainable Health Information Exchange, Roles for State Level Public-Private Partnerships.” November 5, 2007.

Principles	Percent of States including the principle	Examples
4. Identify its purview as statewide	62%	<i>New York eHealth Collaborative</i> : A public-private partnership that will serve as a focal point for healthcare stakeholders to build consensus on <u>state</u> health IT policy priorities... .
5. Indicate the importance of privacy and security	57%	<i>CalRHIO</i> : A collaborative statewide initiative whose mission is to improve the safety, quality, and efficiency of healthcare through the use of IT and the <u>secure</u> exchange of health information.
6. Articulate a patient-centric focus	33%	<i>Delaware Health Information Network</i> : To facilitate the design and implementation of an integrated, statewide health data system to support the information <u>needs of consumers</u>

In addition, many states maintain work groups to identify, prioritize and assess progress against clinical objectives. In New York for example, the Statewide Collaborative Process includes a Clinical Priorities Work Group that defines the clinical priorities that best demonstrate critical areas and opportunities for improvement in both the quality and efficiency of health care to guide the implementation of New York’s Health Information Infrastructure.³¹

New York’s Clinical Priorities Work Group develops clinical requirements, identifies workflow issues, and advances policy recommendations to help drive and test the development of policies, protocols and standards for New York’s Health Information Infrastructure, including the Statewide Health Information Network for New York (SHIN-NY), electronic health records, personal health records, and clinical informatics services.

The development of information technology systems historically has relied on the identification and description of use cases. Use cases are the series of events that outline what a system (or systems) needs to do to achieve a specific mission or stakeholder goals. Use cases define relevant stakeholders, information flows, issues, and system needs that apply to the multiple organizations participating in these specified data exchanges.

With respect to health IT, use cases have guided the development of HIE efforts at the national, state, and local levels. At the national level, the American Health Information Community (AHIC) defined and the HHS Secretary accepted a series of use cases to advance standards harmonization, define architecture specification, inform certification consideration, and provide the framework for detailed policy discussions to advance the national health IT agenda.

In determining the sequence of implementation, state-level HIEs typically assess candidate services and use cases across the following criteria: (1) the clinical value generated, (2) the degree of competition for the service, (3) the breadth and depth of potential clients, (4) anticipated net revenue and return on investment, (5) technical difficulty; and (6) vendor interest, capabilities, and costs for service provision.

³¹ More information on the Clinical Priorities Work Group is available at <http://www.nyehealth.org/collaborative-workgroups#CP>.

The table below highlights the use case implementation strategies for the more advanced statewide HIEs.

Use Case Implementation Strategies

State	State-level HIE Initiative	Proposed Use Cases and HIE services
California	CalRHIO	<ul style="list-style-type: none"> • Phase 1: Medication history and diagnostic results delivery to Emergency Departments
Delaware	Delaware Health Information Network	<ul style="list-style-type: none"> • Phase 1: Clinical results/reports delivery; public health reporting • Phase 2: Med and patient histories, eOrders, patient portal, enhanced Public Health reporting • Phase 3: Physician workflow management and administrative functions
Maine	HealthInfoNet	<ul style="list-style-type: none"> • Phase 1: Patient ID & demographics, encounter histories, lab and radiology results, patient consent management via secure, Internet-based portal • Phase 2: Adverse reactions/allergies, medication history, diagnosis/conditions/problems, dictated/transcribed Documents
Minnesota	Minnesota HIE	<ul style="list-style-type: none"> • Phase 1: Medication history view • Phase 2: Eligibility checking
Rhode Island	Rhode Island Quality Institute	<ul style="list-style-type: none"> • Phase 1: Medication and lab histories via secure, Internet-based portal • Phase 2: TBD
Utah	Utah Health Information Network	<ul style="list-style-type: none"> • Phase 1: Administrative data delivery • Phase 2: Clinical results delivery
Vermont	Vermont Information Technology Leaders	<ul style="list-style-type: none"> • Phase 1: Medication histories to Emergency Departments • Phase 2: Chronic Disease Management

Attachment 5 provides a table of use case definitions, value propositions, and criteria for sequencing implementation.

States' Approaches to Advance Health System Improvements

The Vermont Information Technology Leaders (VITL), an independent public-private partnership that provides governance and technical functions, identifies its mission as follows:

Our vision is for a healthier Vermont, where shared health information is a critical tool for improving the overall performance of the healthcare system. The healthcare community will work together to achieve new efficiencies through the use of information technology in order to deliver better overall value and care to our citizens.

VITL has been charged by the General Assembly with the task of writing the Vermont Health Information Technology Plan (VHITP). At the General Assembly's direction, VITL is designated in the plan to operate the exclusive statewide HIE network. VITL is tightly coupled with the State's health system framework.

VITL facilitates the adoption of EHRs, improves the quality and efficiency of patient care through clinical transformation in physician offices, controls health care costs, and fosters HIE among health care provider organizations. According to its January 2009 Progress Report, VITL coordinates with other state and federal initiatives including the NHIN, the Vermont Blueprint for Health, and the Vermont Health Care Reform initiative.³²

"VITL recognizes that technology alone cannot resolve the challenges a practice faces in trying to provide quality care while maintaining financial viability. Applying technology without first addressing fundamental workflow issues is often the root cause of implementation failures. Installing information technology without practice redesign will only enable "bad" care to be delivered faster, not necessarily better. The technology, in the form of electronic health records and electronic health information exchange, is best added to an efficient system to achieve desired quality of care and return on investment."

In Maine, HealthInfoNet coordinates its efforts with statewide strategies to improve quality measurement, public reporting of data, and identification of high achievers.³³ Among its partners are the Maine Quality Forum, which seeks to improve the data that is made public to health care consumers, and the Maine Health Data Organization, an independent executive agency with a public/private board that maintains a publicly accessible database of health information.

C. Privacy and Security Policies

Strong privacy and security policies are a critical component of building the trust among stakeholders that participate in interoperable HIE.

Many state laws that govern the exchange of health information have their roots in a paper-based environment. At times these laws do not account for more efficient electronic processes or the complexities of an electronic environment in which patient health information can be readily exchanged among multiple care providers. Federal law, while less variable than state law, has also shown areas where an electronic environment may require new or different approaches to protecting health information.

Consequently, moving from a paper-based to an electronic health system requires all stakeholders from patients to legislators to consider whether or not the new challenges and opportunities presented by electronic health information exchange (e.g., authentication, record location, identity management) call for changes to the way health information is protected.

³² Vermont Information Technology Leaders. "January 2009 Progress Report". January 2009. Available online at <http://www.vitl.net/uploads/1233933889.pdf>.

³³ HealthInfoNet is an independent, nonprofit organization whose mission is to create an integrated statewide clinical sharing infrastructure that will provide a secure data sharing network for both public and private healthcare stakeholders across the state of Maine. Additional details about HealthInfoNet is available online at <http://www.hinonet.org/>.

In planning and implementing their statewide HIE strategies, states have recognized the fundamental importance of addressing privacy and security and have undertaken collaborative efforts to overcome the challenges associated with doing so. The Health Information Security and Privacy Collaboration (HISPC) is one such initiative in which a number of states worked to assess variation among business practices, policies, and laws to gain a better understanding of the privacy and security landscape within their states.³⁴ Insights generated through this process have enabled participating states' to better understand their privacy and security environment, create comprehensive plans and solutions to address the challenges presented by electronic exchange, and build a nationwide network of colleagues with expertise in privacy and security.

ARRA included a number of privacy provisions and added a new layer of requirements which states will now need to consider and incorporate into their statewide HIE plans. These new privacy requirements include, but are not limited to:

- Direct application of certain HIPAA Security Rule, Privacy Rule, and enforcement provisions to business associates.
- Notification of affected individuals in the event their protected health information is breached.
- New restrictions on the use and disclosure of protected health information (PHI) including (1) a prohibition against covered entities receiving remuneration for the disclosure of PHI without the affected individual's express authorization, (2) more stringent limits on the use of PHI for marketing purposes.
- Revised patient rights related to electronic health records (EHRs), including requirements that covered entities maintaining EHRs give individuals copies of their records in electronic form and provide an accounting of all disclosures of an individual's PHI during the prior three years.
- Heightened HIPAA enforcement mechanisms, including the creation of a tiered system of significantly increased civil penalties for violations of HIPAA, and the authorization of State Attorneys General to bring civil actions to enforce HIPAA.

States' Approaches to Advance Privacy and Security

A key lesson from states' experiences is the importance of collaborative development of data sharing policies and practices. These policies and practices are the ways in which privacy and security requirements are operationalized, and effective controls over data access and use are maintained in practical terms across diverse health care settings and organizations. As an essential component of HIE, building consensus for consistent, practical data sharing policies across independent health care entities is a challenging proposition. It typically has evolved through a phased sequence of implementation steps that begins with crafting a framework of agreed upon interoperable policies and practices.

³⁴ Additional information about HISPC is available online at <http://www.rti.org/hispc>.

- It is first necessary to identify and resolve threshold issues to put into place high-level guiding principles that serve as a foundation for the subsequent development of a set of more detailed privacy policies and procedures. Then, stakeholders need to be engaged to collaborate and build consensus around those detailed privacy policies and procedures.
- Interoperable policies and procedures must be aligned to support compliance with statutory and regulatory requirements and oversight mechanisms for ensuring privacy and security protections.
- Organizational capacity, and institutional roles and functions must be established to manage policy monitoring and development on an ongoing basis. In an evolving HIE environment a credible deliberation process is required to ensure that policies iterate to address current conditions and ensure that emerging best practices are incorporated as part of ongoing HIE governance.

1. Policy Interoperability. The seamless flow of information sharing requires interoperability at both a technical and policy level. Policy interoperability is critical to facilitating a chain of trust that exists among the multiple networks comprising the statewide HIE infrastructure. Creating a consistent set of statewide HIE policies that are also aligned with federal data sharing policies ensures that participants can map their workflow and technical implementation to one consistent interpretation, thereby reducing development and operational costs. A common statewide privacy and security framework across all care settings and types of HIE also eliminates the need for consumers and organizations to learn or adapt to multiple privacy and security regimes.

As state-wide health information exchange activities mature it is important for stakeholders within their state to also consider what policies may be needed to foster interstate exchange. Without common approaches to resolving variability in state law and policy, especially in the areas of privacy and security, state-wide health information exchange may make less of an impact. This would be particularly true of states that share major metropolitan areas. Through the work of the HISPC, several multi-state collaboratives have been developing solutions to better manage state law and policy variability. Some of the potential solutions include an interstate compact, model or uniform law, and other approaches that promote states working together.

2. Oversight and Enforcement. While strong privacy policies are necessary for facilitating HIE, without a structure in place to ensure compliance, they alone are not a sufficient means by which to guarantee the protection of a patient's personal health information. Statewide accountability and enforcement mechanisms are critical to ensure statewide interoperability.

As noted above, States, acting primarily through the agencies of state government, have three principal means to protect the public's interest and ensure accountability of HIEs in the state: (1) direct oversight through legislation or regulation of entities, (2) contracts with specific entities, and/or (3) indirect oversight in which the state designates or confers authority to another organization (e.g., an accreditation body) to develop and manage the evaluation of entities in an industry.

States may also use some combination of all three options when developing enforcement mechanisms and these variations are often reflective of state-specific circumstances. For

example, if projects are supported with public funding, such as has been the case in Florida, Michigan, New York and Tennessee, State Governments are using contracts to ensure that state funds are used in accordance with the state's policy goals and in a way that protects the public's interest

As part of their accountability structures, some states have established a common statewide HIE policy framework through statute and regulation. Stakeholders in Minnesota chose to pass new legislation to govern the practice of HIE. In 2007, the Minnesota legislature amended the existing Minnesota Health Records Act, which was originally passed in 1977. The updated law defines key terms and components of HIE (including a Record Locator Service) and clarifies consent-related requirements for the electronic exchange of information.

3. Developing Organizational Capacity to Address Privacy and Security. Developing a capability to address statewide privacy and security considerations in an ongoing fashion is an important governance function that has evolved as a component of many states' organized state-level HIE efforts. Like standards and technology, privacy and security laws, regulations, and policies aren't static. As state-level HIE leaders have learned in the context of their multifaceted HIE implementation efforts, policy development proceeds iteratively, and unforeseen issues will arise and need to be addressed in a timely and competent manner so as not to stall the overall effort. State-level HIE governance entities anticipate that overseeing HIE policies and practices is an ongoing organizational responsibility, especially as they link local and statewide efforts with federal HIE policy guidance.

Many states, typically begun as part of their federally-sponsored HISPC activities, have developed collaborative mechanisms and advisory groups particularly to support the creation of statewide policy and guidance. These working groups and advisory boards have served as valuable resources to identify, assess, track, and provide guidance on privacy and security issues on an ongoing basis during early stages of HIE development. Typically, work groups have targeted the following major data sharing domains: the "4 As" of authorization, authentication, access, and audit; consumer consent; and contractual or regulatory options. Some states have institutionalized these bodies as permanent entities, such as the California Office of Health Information Integrity housed within the Health and Human Services Agency. Questions remain as to the long term trajectory of these types of bodies and how their relationships will evolve as part of the HIE organizational landscape.

D. Technical Design of Information Infrastructure

In order to reduce risk and overall costs, state-level HIEs are aggressively pursuing implementation strategies for scaleable architectures and shared infrastructure across multiple data providers and consumers.

A key component to building the technical framework to advance interoperability is the recognition that state-level HIEs offer the potential to create and leverage shared services across a wide range of stakeholders. Use of IT in other industries demonstrates that shared services, when implemented effectively, can:

- create a customer orientation,
- provide process rationalization, repeatability and predictability,

- reduce redundancy and complexity, further reducing costs and improving reliability, and
- improve the use of scarce, often expensive, resources.³⁵

In their attempts to define and support the blended value proposition for a shared infrastructure, representatives from state-level HIEs described the following challenges:

- **Clarifying Objectives.** The technical infrastructure should be driven by statewide health care objectives and priorities. In order to first define and rank the goals and then build the necessary consensus to support implementation, state-level HIE efforts require governance structures, stakeholder participation, and dedicated resources.
- **Defining Shared Services.** State-level HIEs must identify core services and functions that are valued across a wide range of stakeholders and don't pose disruptive or competitive challenges to existing and planned systems. In this regard, the experiences of successful HIEs at regional levels may provide valuable lessons to state-level HIEs.
- **Selecting and Prioritizing Technical Services.** State-level HIEs often face difficult decisions between supporting near-term HIE solutions and investing in services that would advance the longer term goals of full interoperability. In evaluating their options, state-level HIE efforts seek to maximize value vis-à-vis the costs for creating systems to support statewide interoperability. State-level HIEs typically assess candidate services across the following criteria: (1) the clinical value generated (e.g. quality improvement), (2) the degree of competition for the service, (3) the breadth and depth of potential clients, (4) anticipated net revenue and return on investment, (5) technical difficulty; and (6) vendor interest, capabilities, and costs for service provision.
- **Addressing Bundled Services.** Some of the services that would be potential candidates to be offered as shared services are part of vendor's bundled technical and pricing package. Accordingly, vendors may be reluctant to unbundle their products and risk losing any financial benefits and leverage associated with providing those services.
- **Selecting Vendors.** HIE infrastructural services (e.g., Master Person Index, Record Locator Services, data normalization, authentication) and applications (e.g., EHRs, PHRs, electronic prescribing, reporting tools) vary dramatically in their capabilities, performance, reliability, and costs. While state-level HIEs continue to use Requests for Proposals to assess vendor products, the variability of platforms and offerings makes price/performance evaluations challenging.³⁶

In determining the sequence of implementation, state-level HIEs typically assess candidate services and use cases across the following criteria: (1) the clinical value generated, (2) the degree of competition for the service, (3) the breadth and depth of potential clients, (4) anticipated net revenue and return on investment, (5) technical difficulty; (6) vendor interest,

³⁵ *What Every IT Leader Should Know About Shared Services.* Gartner (August 2005). A summary of the report is available online at http://www.gartner.com/resources/130100/130122/what_every_it_1.pdf.

³⁶ A catalogue of publicly available Requests for Proposals (RFPs) for State-level HIE activities is available online at <http://www.slhie.org/Docs/CategorizationOfStateHIEPlansRoadmapsReportsRFPs.xls>.

capabilities, and costs for service provision; and (7) the “readiness” of standards (i.e., the extent to which the underlying standards are being used by vendors and integrated into their products).

States’ Approaches to Technical Design of Information Infrastructure

While the promise of shared services is widely embraced, the options for bringing full interoperability to scale vary and are influenced by the configurations of healthcare providers, purchasers, payers and supporting organizations, which can differ significantly from state to state. Moreover, state-level HIEs must navigate the various technical implementations, business cases, and operational scale from a range of existing and emerging data networks including local exchanges, integrated delivery networks, aggregators of data for public health and quality purposes, clearinghouses, disease registries, and regional and national data processors.

In these complex environments, state-level HIEs struggle to array resources and prioritize technical implementation. Though approaches continue to evolve and adapt to changing conditions, three alternatives are emerging to achieve statewide interoperability:

- (1) a single, statewide technical utility that provides a few core services that works in coordination with sub-networks in the state,
- (2) a decentralized statewide model in which HIEs provide services to local stakeholders and connect with other HIEs through agreed upon policies, standards, and protocols,
- (3) and a network of “health record banks” through which patients’ directly control access to their health information.

It is important to note that while some state-level HIEs can be categorized into one of the three approaches, others are blending elements of all three and adapting the models to suite their specific circumstances. A comparative analysis of the three models is provided in *Attachment 6*.

Regardless of the implementation model, state-level HIE efforts must address the issues of identifying shared services and aligning implementation to interoperability standards.

Defining and establishing requirements for interoperability will not guarantee the seamless exchange of information. In many cases technical standards for healthcare information systems are not fully mature. Indeed, most healthcare organizations use standards in one way or another for the interchange of information between disparate systems both within and outside of their organizations.

Generalized standards are often not fully effective within healthcare organizations’ operational systems because they may not be sufficiently detailed enough to document or describe all healthcare episodes or transactions required by an organization, or are otherwise poorly structured for this purpose.

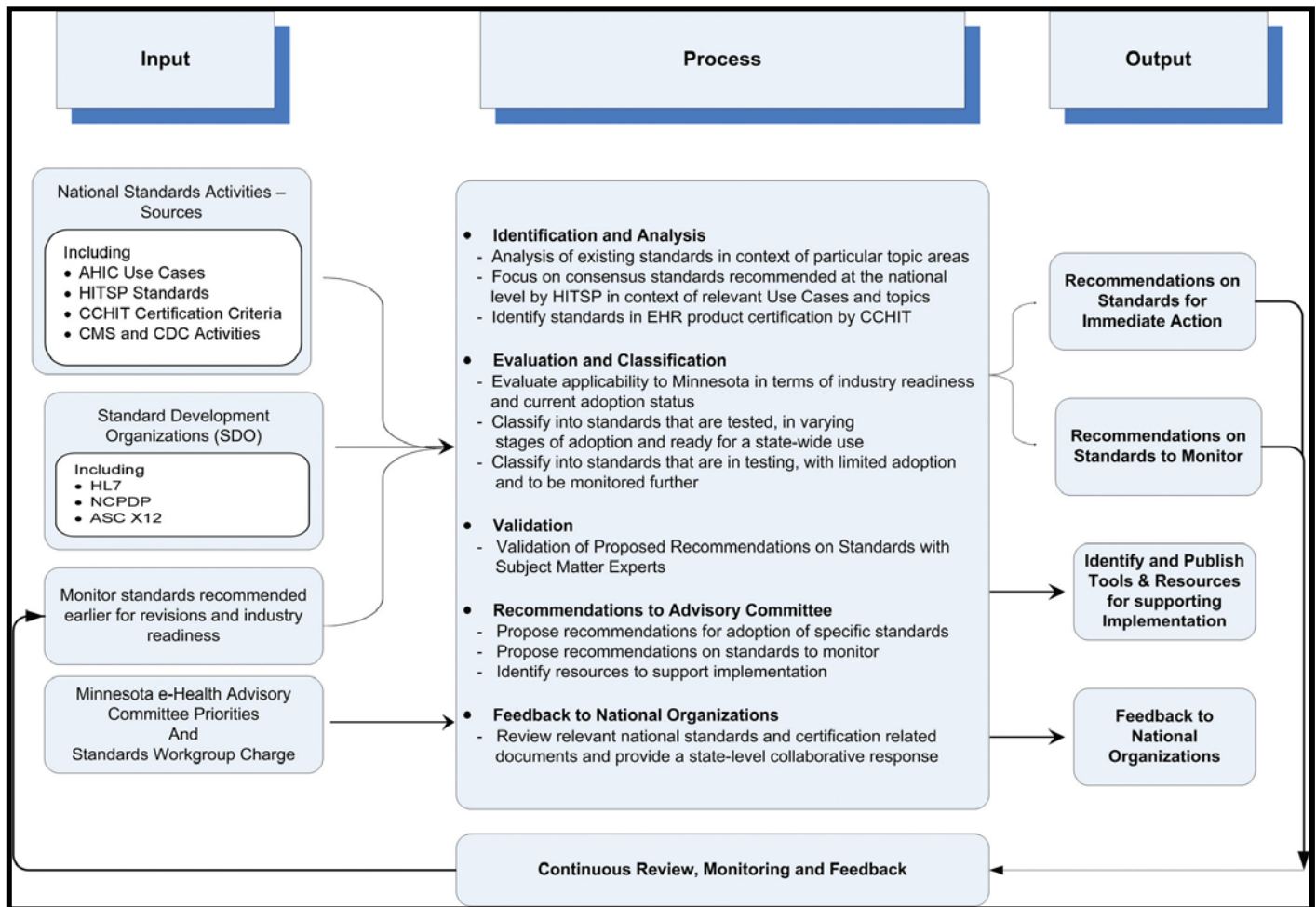
“Because there is no compelling reason to send data across the nation on a regular basis, instead the focus is on working within NHIN standards so that we are “pluggable” into the NHIN which, more importantly, will also allow us to exchange data within localities and across the state... Basically, we want to secure stakeholder buy-in around the policies and standards that will allow for interoperable information exchange; that will allow us to be ready to plug into a statewide exchange and the NHIN.”

In Minnesota,³⁷ standards and protocols are approved through a statewide collaborative process in which all stakeholders participate to help identify national standards and refine the implementation guides.

The Minnesota e-Health Initiative's framework for identifying and recommending standards is illustrated on the following page.

³⁷ In 2005, the Minnesota Department of Health convened the Minnesota e-Health Initiative Advisory Committee. A public-private collaborative consisting of 26 appointed members, the Minnesota e-Health Initiative is working to accelerate the use of health IT to improve healthcare quality, increase patient safety, reduce costs, and enable individuals and communities to make the best possible health decisions.

Minnesota Standards Identification, Review, Approval and Monitoring Process



In New York, the New York eHealth Collaborative is working to develop implementation guides and specifications for a number of its high priority use cases that constitute the SHIN-NY.³⁸ To date, New York eHealth Collaborative has developed “Version 1.0” guides for the following use cases:

- SHIN-NY Information Security Architecture Requirements
- SHIN-NY Medicaid Medication Management Web Services Overview
- EHR Requirements Document

³⁸ A summary of the SHIN-NY technical architecture, the statewide policy framework, and detailed implementation guides are available online at <http://www.nyehealth.org/node/94>.

E. Financing

A state's ability to develop health information exchange (HIE) so that it functions as an effective and ongoing dimension of a statewide health landscape will depend on the ability to both build and sustain the required governance, policy and technical infrastructure components. Whether building a single statewide technical approach or relying on interconnecting RHIOs or health record banks as the locus of implementation, states and their state-level HIE efforts face similar obstacles in (1) securing the financial capital to build infrastructural capacity and (2) developing ongoing revenue streams to maintain operations.

In practical terms, the rationale for an infrastructure to support statewide interoperability is that this level of HIE availability serves many stakeholders across a continuum of purposes, the end result of which is accumulated social benefit for all. Like other instances of shared network systems, statewide and even nationwide interoperable HIE exhibits "public good" characteristics in that it is "non-rival" and "non-excludable." This means, respectively, that consumption of the HIE by one individual does not reduce availability for others; and that no one can be effectively excluded from appropriately using interoperable HIE.³⁹

The experiences of state-level HIE leaders in attempting to build statewide HIE capacity point to a host of challenges. These stem largely from the fundamental nature of HIE and the level of capital investments required to implement to scale. Other factors include cost variability, stages of development and the uncertainty of return on investment (ROI), especially given financing and incentive structures within the existing health care system.

While achieving statewide HIE access will translate into broad societal benefits, securing financing has required engaging a range of individual stakeholders to see value and make investments. This new approach to information sharing threatens the historic competitive positioning of stakeholders with proprietary stakes in the collection of and provision of access to health data.

Based on a review of health IT cost-benefit research, the Congressional Budget Office (CBO) determined that underlying any consideration of the potential benefits of health IT are the financial incentives that influence the behavior of health care providers, hospitals, health insurance plans, and patients.⁴⁰ In its assessment, the CBO asserted the following: "how well health IT lives up to its potential depends in part on how effectively financial incentives can be realigned to encourage the optimal use of the technology's capabilities."

States' Approaches to Advance Financing

In November 2008, the Project released a detailed report on the range of financing approaches and considerations for advancing statewide interoperability.⁴¹ Designing, piloting and implementing interoperable HIE has been shown to be a complex, multi-year process that extends beyond most organizations' annual operating and budgeting cycles. Like other long

³⁹ Varian, H. *Microeconomic Analysis*. W. W. Norton & Co., New York, 1992.

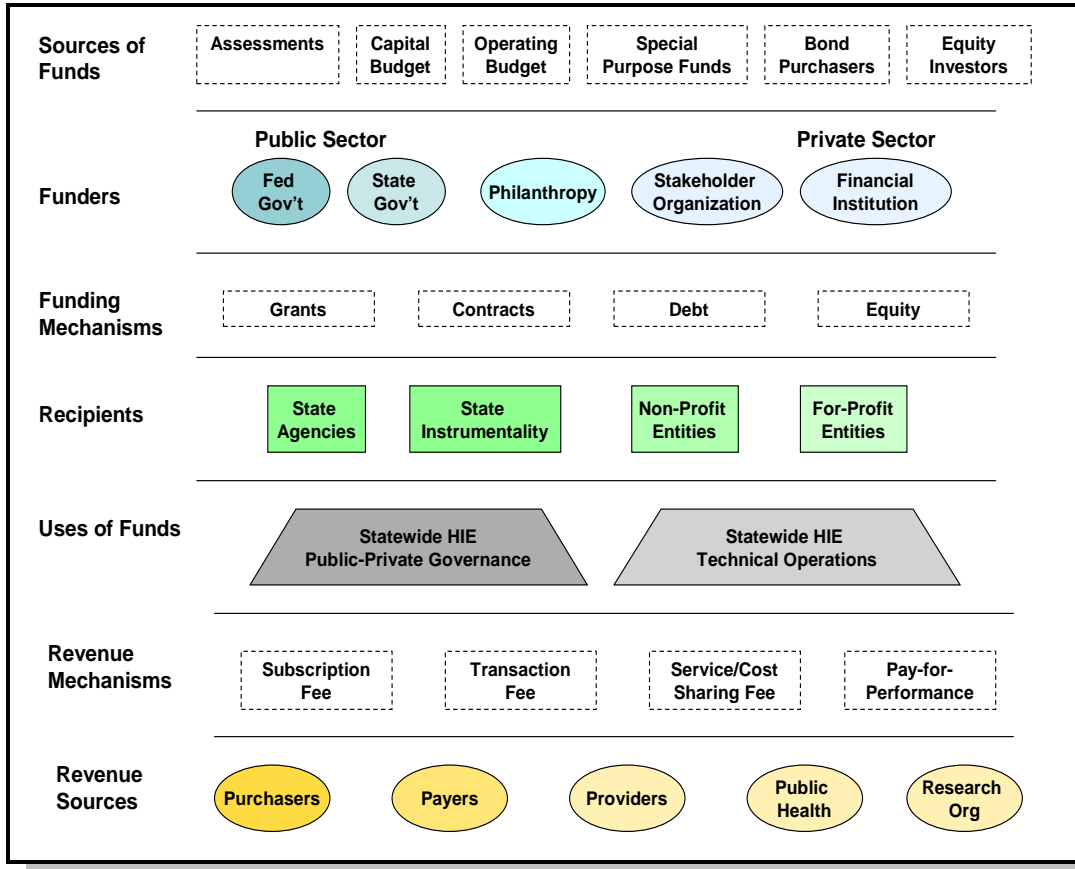
⁴⁰ Congressional Budget Office "Evidence on the Cost and Benefits of Health Information Technology." May 2008. Available online at <http://www.cbo.gov/ftpdocs/91xx/doc9168/05-20-HealthIT.pdf>.

⁴¹ American Health Information Management Association. "State-level HIE Value and Sustainability Approaches for Financing and Bringing Interoperability to Scale." November 5, 2008.

term investments, decisions on when and what to fund are determined largely through return on investment analysis.

As depicted in the figure below, financing of HIE involves a complex array of funding sources, mechanisms, recipients, and revenue sources for financing state-level HIE.

State-level HIE Financing Analytic Framework



Making informed decisions regarding the timing and focus of investments in state-level HIE requires an understanding of the start-up and ongoing costs of implementation and the anticipated returns in savings or revenue generation based on the services offered.

1. Need to Address Start-up Capital. While funding for pilot projects and initial planning have generally been available, bringing interoperability to scale is an iterative, developmental process that requires reliable and sustained funding. Facing challenging economic conditions and misaligned incentive structures, state-level HIEs have had, and continue to have, a difficult time accessing adequate capital.

The public sector, through state and federal grants and contracts, has thus far provided the largest proportion of funding for state-level HIE planning and capacity building. To a lesser extent,

philanthropies and providers, largely through matching contributions, have also supported state-level HIE capacity building.

Research from the Project suggests that no single financing strategy has emerged that works across all settings and circumstances. Instead each state-level HIE effort must understand the opportunities, constraints and limitations inherent to the various funding sources and optimize its strategy based on the characteristics of its healthcare market. An overview of approaches for securing capital financing is provided in *Attachment 7*.

2. Need to Address Ongoing Costs. Achieving statewide interoperability is not a static target that is completed after initial planning and implementation stages. Efforts to build statewide HIE capacity require development of business plans to address the ongoing challenges of sustaining the infrastructure for interoperability that is needed as part of a well-performing health care system .

State-level HIE entities themselves have organizational roles that must be supported. In addition to governance, many states' strategies to address statewide HIE require state-level sponsored HIE technical capacity and services. Provider HIT adoption, community-level HIE efforts, and structured participation by state agencies and other public data sharing entities e.g. public health and Medicaid, also have significance when considering sustainable state-wide HIE financing. In the relative short term, demonstrating that some measure of HIE infrastructure is in place across states is important to address the goals and strategies laid out under the ARRA. For example, in order to take advantage of incentives, the ARRA requires eligible providers to demonstrate that their EHRs connect to information exchanges that improve "the quality of health care, such as promoting care coordination."

Previous research has shown that in order to both solicit start up investments and remain viable beyond initial deployment stages, state-level HIE entities are called upon to identify and deliver value to their stakeholders as customers. In business terms, customers can realize value in one of two ways: through reduced costs, or through creation of new revenue generation opportunities.

There is evidence for the value and sustainability of particular types of HIE services.⁴² Some HIE efforts have developed successful financing models based on transactional efficiencies for participating providers. Many state-level HIE initiatives have begun by offering these select HIE services where providers were willing to invest. However, to advance the full build-out of statewide HIE capacity, state-level HIE initiatives are pushing to assess the viability of shared infrastructure, applications, and the interplay of different types of services and customers for generating the revenues needed to sustain operations and/or repay interest on debt instruments. For state-level HIE entities, customers include diverse stakeholders, and importantly the public at large, who benefit from broad social impacts of high quality, cost-effective health care.

As HIE efforts have progressed, the desire to identify sustainability business models has intensified. State-level HIE informants for this report emphasized the importance of early planning for the long-term sustainability of HIE activities. They emphasize that the influx of

⁴² Development of State Level Health Information Exchange Initiatives Final Report: Extension Tasks, AHIMA/FORE, January 2007.

potential ARRA resources can be seen as contributing to the acceleration of HIE development, but not as the answer to long range sustainability. While setting the stage for potential expanded levels of participation in state-level HIE by providers and public agencies e.g. Medicaid, models for ongoing contribution strategies must be developed.

“A number of these leaders began experiencing their key stakeholders and funding partners pointing to the stimulus bill and suggesting that the local funding problems were solved—that there was no need for local contributions or to continue the very tough work of developing a sustainability model for their local RHIO/HIE. Many of my colleagues described their fundraising and sustainability efforts as hitting a brick wall.

Maybe it's because we've been at this for so long, or perhaps we're a bit jaded, but I can't recall a single stakeholder suggesting that the stimulus bill was the answer to our sustainability prayers. There certainly is anticipation of some assistance in bringing the system to scale, but sustaining it? Absolutely not.”

In Rhode Island, the Rhode Island Quality Institute has undertaken a concerted effort to develop a long-term sustainability model for their state's HIE efforts. The organization has recently contracted with a consulting group in order to finalize the state's sustainability framework, as it sees this being an essential component of the statewide HIE strategy and a crucial piece for inclusion in its statewide HIE plan currently under development. Michigan also listed developing a long-term sustainability framework as a top priority for the state and as likely one of its immediate next steps in moving forward with state-level HIE and ARRA planning.

As with the identification of capital mechanisms, state-level HIEs typically identify a set of core principles to guide the identification and selection of sustainability options. First, specific points of transaction within HIE are often sought because they are easily identified, discrete, and in the context of HIE, represent a burden on the network that entails marginal costs. Second, payment burdens for financing the ongoing maintenance and improvement of the HIEs should be borne across the full range of customers, with no single constituency of an HIE forced to bear a disproportionate share of the costs. Finally, there is an effort to recapture a portion of any savings derived from the use of the exchange. Ultimately, meeting this final criterion depends in large part on the actual costs assessed per transaction.

F. Health IT Adoption

Critical goals for health IT and HIE include achieving broad societal benefits from both improved personal health care and population health. This implies that a critical mass of providers need to adopt health IT and interconnect with interoperable HIE systems, and that effective data sharing must be achieved beyond the self-interests or resource capacities of particular providers, communities or health systems in the marketplace.

Recognizing that the ability to harness the full potential of HIE to improve healthcare delivery heavily depends on widespread provider adoption of health IT systems, states have incorporated a focus on activities to advance health IT adoption into their statewide HIE strategies. These activities include the creation of incentive programs, health IT mandates, or technical assistance programs that help providers in overcoming the well-documented challenges of fully digitizing a provider's workflow.

States' Approaches to Advance Health IT Adoption

1. Incentives. Many states have developed incentive programs to mitigate the significant financial barriers that providers face in attempting to purchase, implement, and make ongoing use of health IT systems. For example, Florida's Medicaid agency has implemented an e-prescribing (eRx) pilot program for the state's highest volume Medicaid providers to encourage their adoption of eRx.

States are also exploring ways to create financial incentives for other stakeholder groups that might be able to exert a direct or indirect influence on provider adoption of health IT systems and use of these systems for electronic data exchange. Michigan has taken exploratory steps in this direction by including incentive payments for Medicaid Managed Care Organizations within that state who support and participate in local HIE activities.

A number of states are targeting incentives for particular categories of providers, particularly in rural and underserved areas.

- In Georgia, the Georgia Department of Community Health (DCH) supports the Medicare Electronic Health Records Community Partnership, a program aimed at increasing EHR adoption among small- and medium-sized physician practices statewide. The five-year program will provide financial incentives to physician groups that use certified EHRs to meet clinical quality measures, according to the Georgia DCH. The state will pay physicians annual bonuses for each year they score on a standardized survey assessing EHR use to support care delivery. The State also provided \$750,000 to the Georgia Association for Primary Health Care to establish a statewide EHR system to link federally qualified community health centers.⁴³
- In Minnesota, the Minnesota Department of Health supported the Electronic Health Record Revolving Account and Loan Program. Created in 2007, the program provides six-year, no-interest loans of up to \$1.5 million on a first-come, first-served basis to help

⁴³ Source: http://dch.georgia.gov/vgn/images/portal/cit_1210/60/30/546326314-13-06minutes.pdf

Minnesota's rural hospitals, small town physician clinics, nursing homes and other community healthcare providers replace their paper records with EHR systems.⁴⁴

- In Tennessee, the Physician Connectivity Grant seeks to accelerate the use of health IT at the point of care and, ultimately, to improve the quality of health care available to Tennesseans. The State will reimburse actual costs not to exceed \$3,500 per Tennessee licensed physician, and \$2,500 per Advanced Practice Nursing and Physician Assistant prescriber. The funds per prescriber can be used for equipment software and services required to connect to the Tennessee eHealth Network, the State's private and secure network. Connectivity to and authentication to the Tennessee eHealth Network, is also covered under the grant but is paid directly by the State for one year.⁴⁵

2. Health IT Mandates. A few states have established mandates for the use of health IT tools. Minnesota enacted two mandates for the purchase of health IT systems. The first requires hospitals and health care providers to have interoperable EHR systems by 2015. The second requires that, by 2011, all providers, group purchasers, prescribers and dispensers establish and maintain e-prescribing systems.

Massachusetts tied implementation of computerized physician order entry and EHRs to facility licensure standards for hospitals and community health centers. The Department of Public Health is charged with adopting regulations to require implementation of computerized physician order entry by Oct. 1, 2012, and of EHRs by Oct. 1, 2015. The systems are to be certified by the Certification Commission for Healthcare Information Technology or its successor.

Certificate of needs (CON) regulate the upgrade, expansion and building of new hospitals. At least two states have provisions relating to interoperable health IT systems in their CON laws. Vermont, for instance, allows expedited review of CON applications for health IT projects that among other things are consistent with the state health IT plan. New York requires that hospitals investing in new health IT systems enable them to connect with the state's HIE.

3. Technical Assistance. Paramount with addressing and overcoming the financial barriers associated with health IT adoption are the practical challenges of implementing these new technologies and integrating them seamlessly into provider workflows. Accordingly, several states have undertaken initiatives to offer providers the necessary on-the-ground technical and implementation assistance.

- In Minnesota, the Minnesota eHealth Initiative created a work group to address the effective use of EHR systems to help providers meet the statewide mandate. The workgroup is charged with identifying practical guidance for health care providers on how to address some of the most commonly perceived barriers to effective use of EHRs in order to help improve the quality and safety of health care and improve the health of communities. This includes but is not limited to organizational issues (i.e., governance,

⁴⁴ Additional details available online at <http://www.health.state.mn.us/e-health/funding.html>.

⁴⁵ Additional details available online at <http://ehealth.state.tn.us/>.

leadership, and adequately trained staff), clinical decision support systems, and quality improvement/population health.⁴⁶

- In Rhode Island, the Rhode Island Quality Institute has developed a strategy built around the concept of using social networking mechanisms as a way to drive physicians' adoption of health IT. Through this initiative, RIQI first surveyed physicians throughout the state to identify which of their colleagues were viewed as thought leaders within the physician community. RIQI then conducted a targeted outreach effort to these community leaders in order to encourage their adoption of health IT systems, the theory being that other early adopters in the community would soon follow them, as would eventually late adopters. By relying on social networking structures in which respected leaders in the physician community reach out to other physicians and serve as the driving force behind the EHR adoption initiative, RIQI hopes to be able to change the behavior of the majority of physicians within the state by targeting the behavior of a select few.
- In Arizona, the Arizona Health-e-Connection is leading the creation of the Arizona EHR Collaborative Purchasing Program (CPP). Slated for an early 2009 launch, the first phase of the CPP is designed to help primary care providers in small- and medium-sized practices with the transition to an affordable, user-friendly EHR system.⁴⁷

The ARRA attempts to address the critical need for the provision of technical and implementation assistance through its creation of Health IT Regional Extension Centers ("Extension Centers"). The Extension Centers are tasked with providing technical and change management assistance and disseminating best practices to providers that are struggling with the implementation and use of their EHR system.

Nearly every respondent in our interviews indicated that they view these Extension Centers as potentially playing a crucial role in their state's effort to drive health IT adoption and widespread HIE, and are actively developing strategies regarding coordinating activities across the statewide HIE entity and the Extension Centers in order to ensure these activities are carried out in concert with broader HIE objectives and plans. Some states have even begun considering organizations within their state that may be capable and interested in applying for Regional Extension Center status, and have started to reach out to these entities to discuss the possibility of their applying.

However, respondents expressed concern at the uncertainty around how the program will be implemented and the impact that this may have for these coordination efforts. Respondents also worry that if only a handful of Extension Centers are created and tasked with serving providers in multiple states, this could severely hamper efforts to coordinate state HIE efforts with Extension Center activities, as well as dilute the centers' impact in facilitating providers' successful adoption of health IT systems. Still, the majority of respondents indicated their intent to reach out to their assigned Extension Center in an attempt to coordinate activities across the two entities, even if the Center is located outside their state.

⁴⁶ Minnesota eHealth Initiative's Effective Use of Electronic Health Record Systems Work Group. Meeting Summary December 17, 2008. Accessed via <http://www.health.state.mn.us/e-health/wgs0809/eu012109hndout.pdf> on March 28, 2009.

⁴⁷ Additional details regarding the program are available at <http://www.azhealthrecord.gov/CPP/Default.aspx>.

4. Assistance with Network Connectivity. In January 2008, organizations in 42 states and three territories received grants totaling \$417 million from the Federal Communications Commission (FCC). The 69 grants were meant to enable clinics, hospitals, universities, research centers, behavioral health sites and correctional facility clinics to connect to “broadband” Internet access.⁴⁸ Often shortened just to broadband, this type of network is high-speed (at least double the speed of dial-up access over a modem) and enables users to transfer large amounts of data—such as x-ray images, videos and medical records—over a network line.

Florida was one such state to have received over \$9 million in FCC grant funding to establish a wireless broadband network for electronic healthcare communications in rural areas. A significant portion of the FCC grant is being used to provide the infrastructure necessary for rural hospitals and other healthcare providers in rural Panhandle communities to participate in the electronic exchange of health information with other providers throughout the region, state, and country that are also connected to the network. The state also plans to offer these rural providers the services of the Pensacola or Big Bend RHIO.

Florida also hopes to leverage this broadband opportunity as a mechanism for facilitating broadband access for all providers in the state, not just in rural areas. To this end, the state HIE is reaching out to Florida LambdaRail, a high-speed research fiber-optic network initiative for research universities and technology companies in the state, to discuss the possibilities of connecting all providers in the state to the broadband network and of providing the connectivity that will allow for statewide HIE.

⁴⁸ For more information on the FCC Rural Broadband initiative, see <http://www.fcc.gov/cgb/rural/rhcp.html#orders>

IV. DEVELOPING A STATE PLAN, TRACKING PROGRESS

A. Developing A Statewide Plan

The ARRA calls for health IT related programs and funding to be tied to the ONC-Coordinated Federal Health IT Strategic Plan, while also calling for the Strategic Plan to be updated by ONC.⁴⁹ In this way, Congress has acknowledged the need for multi-level coordination. For state-level efforts, this generates even greater focus on states' strategic plans and the extent to which they foster coordinated activities across local, regional, and national levels.

The current federal Health IT Strategic Plan has two main goals:

1. Transforming care delivery, personal health, and support through the access to and use of electronic health information; and,
2. Advancing population health (public health, biomedical research that makes use of health care information, health care quality improvement, and emergency preparedness) through timely access to and use of electronic health information.

Underpinning the approach to these goals is a commitment to a public-private, multi-stakeholder approach and the need for reliability, confidentiality, privacy, and security when exchanging, storing, and using electronic health information. Four recurring themes apply across the Strategic Plan's goals and related objectives:

- Collaborative governance,
- Privacy and Security,
- Interoperability, and
- Adoption.

Over the last five years, almost all states have engaged in developing health IT strategies at some level and to date, 36 state-level HIE plans or roadmaps have been publicly released. An index of these roadmaps is provided in *Attachment 8*. Many states do not yet have roadmaps in place; some have plans under development. In other states existing plans require updates to reflect emerging issues and challenges.⁵⁰ States will likely need to revisit roadmaps to reflect ARRA requirements. While there is no universal template for a comprehensive statewide health IT and HIE plan, most plans share common components and content, and are created with very similar processes as described below.

- **Components.** Strategic plans/roadmaps typically define vision, priorities, objectives, sequencing, measures, risk mitigation strategies.
- **Content.** Strategic plans/roadmaps address the foundational threshold issues of establishing governance, interoperable policies and practices for ensuring privacy and security, technical approach and HIE implementation priorities, financing, and outreach.

⁴⁹ The current version of the National Coordinator's strategic plan, "The ONC-Coordinated Federal Health Information Technology Strategic Plan 2008-2012" is available online at <http://www.hhs.gov/healthit/resources/HITStrategicPlan.pdf>.

⁵⁰ *Accelerating Progress: Using Health Information Technology and Electronic Health Information Exchange to Improve Care*. State Alliance for eHealth (September 2008). Available online at <http://www.nga.org/Files/pdf/0809EHEALTHREPORT.PDF>.

- **Creation.** Strategic plans are usually developed and vetted with stakeholders through an inclusive and transparent public process.

B. Statewide Plans and Measuring Progress

State-level HIE leaders acknowledge that building and sustaining HIE depends upon being able to realize their stated objectives and deliver demonstrable value. As part of their roadmaps and business plans, some state-level HIE efforts serve as important examples for identifying objectives and developing mechanisms to gauge progress toward articulated goals.

“Measuring and assessment have been foundational elements of our statewide health IT and HIE efforts. We believe that ‘what gets measured, gets done.’”

Achieving statewide HIE goals is a systems-focused effort, involving multiple stakeholders, and incremental processes. Additional work needs to be done to define the measures and mechanisms that will be used to assess the near term effects and systemic impact of statewide HIE development efforts. The ARRA highlights the importance of identifying use cases and achieving HIE results that support health care system improvements e.g. the quality of health care, such as promoting care coordination, and improving public health. Demonstrating that progress has been met toward these ends requires state-level HIE efforts to articulate incremental expectations and ways to measure progress in meeting targets for HIE implementation and impact.

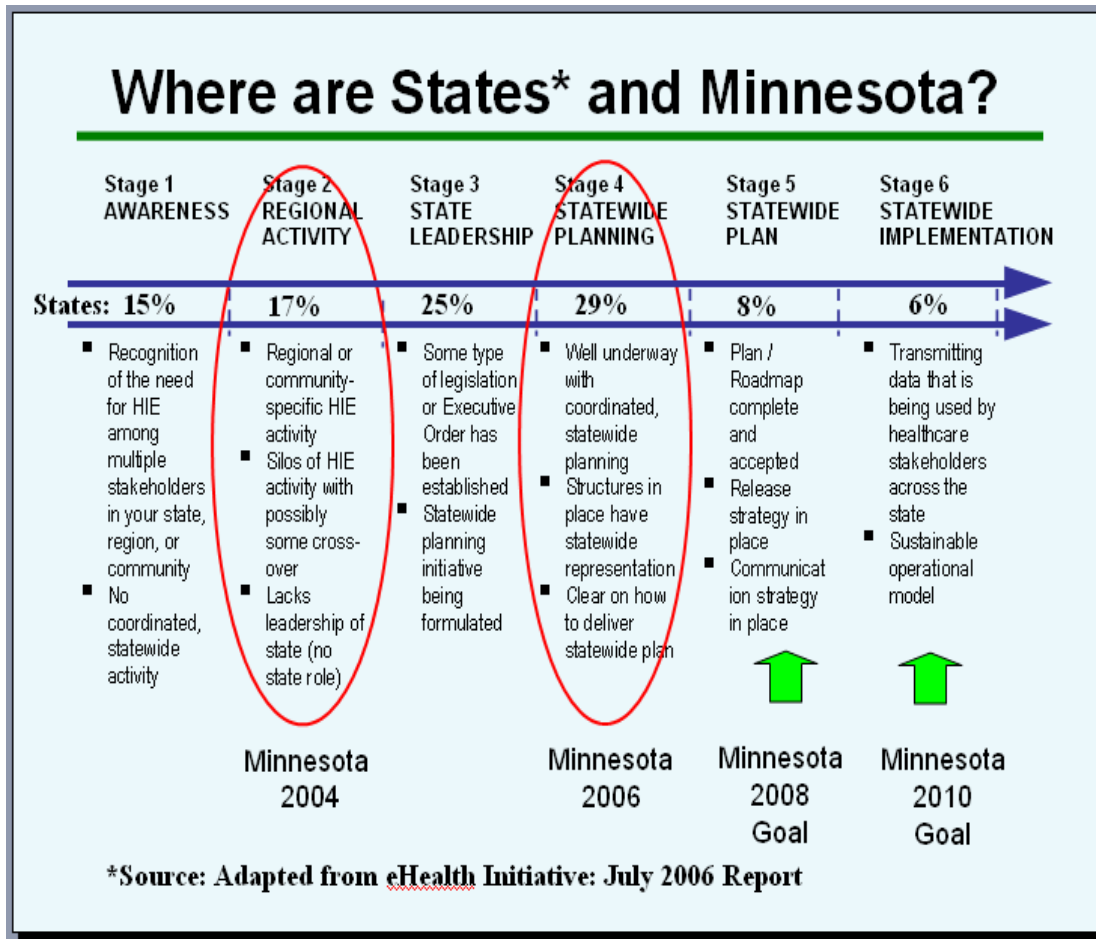
Highlighted below are a range of efforts that have been launched to track and report on progress and ensure accountability for the expenditures of public funds.

Tracking Progress

In Minnesota, the state-level HIE, the Minnesota eHealth Initiative, used a staging model developed by the eHealth Initiative to demonstrate its progress along an implementation continuum.⁵¹

⁵¹ *Accelerating e-Health in Minnesota: 2007 Minnesota e-Health Initiative Report to the Minnesota Legislature.* Minnesota Department of Health (January 29, 2007). Available online at <http://www.health.state.mn.us/e-health/legrpt2007.pdf>.

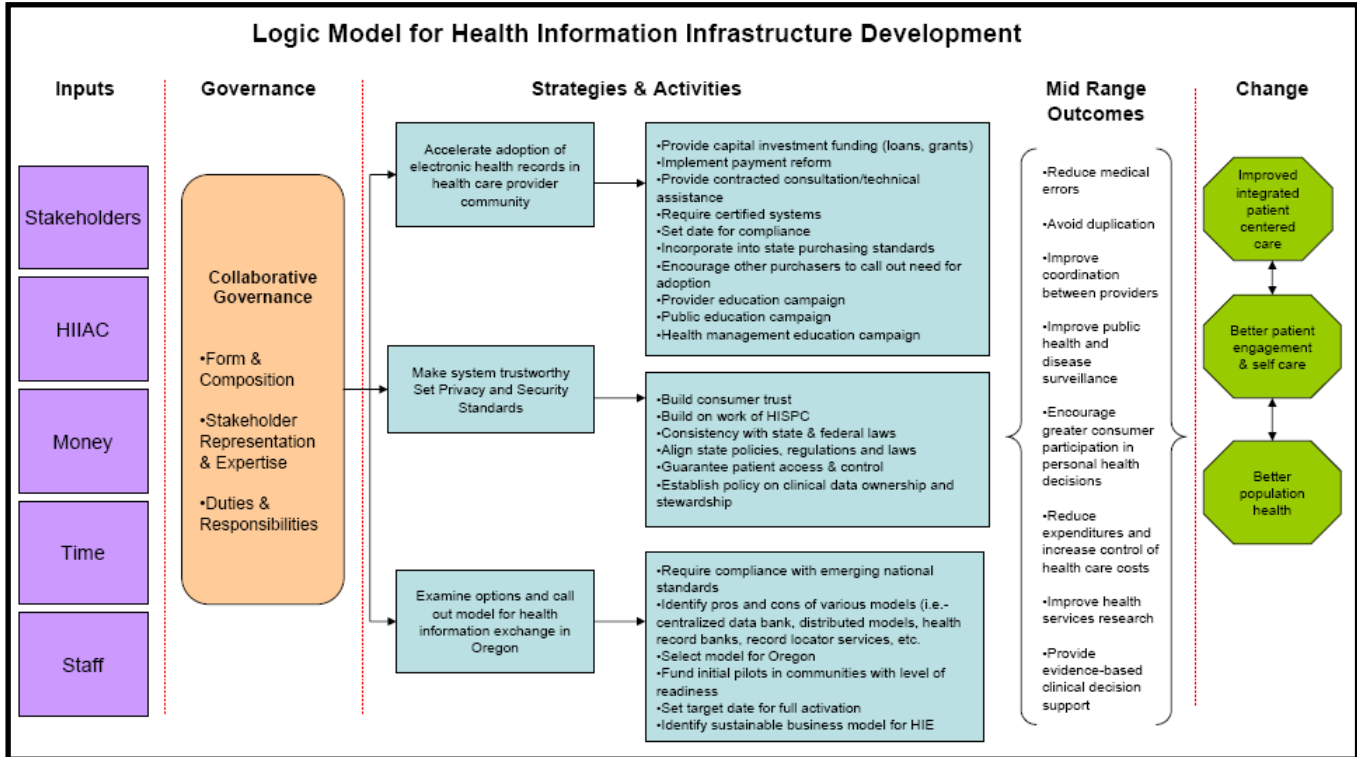
Minnesota's state-level HIE implementation timeline



Against these broad parameters, a few state-level HIEs have developed more granular objectives and measures. In Oregon, the state-level HIE governance entity, the Health Information Infrastructure Advisory Council (HIIAC), developed a logic model built around inputs, processes, and outcomes to identify the activities and delineate milestones and anticipated results for the statewide HIE activities.⁵² See Figure below.

⁵² Health Information Infrastructure Advisory Committee (HIIAC) Meeting Notes for Thursday, June 19, 2008. Available online at <http://www.oregon.gov/OHPPR/HIIAC/MeetingMaterials.pdf>.

Oregon's proposed evaluation framework for HIE implementation & health IT adoption



Developing Measures

Developing performance metrics to assess the impact of state-level HIE is an area of intense interest for funders, stakeholders, and participants.⁵³ Recognizing that most HIE efforts lack the skills and resources to build and conduct rigorous evaluations, the federal government and a handful of state-level HIE initiatives have launched programs to support HIE research efforts.

The US Department of Health and Human Service's Agency for Health Care Research and Quality (AHRQ) maintains an "Evaluation Toolkit for Data Exchange Projects."⁵⁴ As part of its multi-year contracts for state and regional HIE demonstration projects, AHRQ is also working with its awardees to identify common progress and evaluation measures that can be used across a range of projects.

⁵³ Two reports of note include: (1) Labkoff, S. and Yasnoff, W. "A framework for systematic evaluation of health information infrastructure progress in communities." *Journal of Biomedical Informatics*. Feb 2006; and (2) Hripcsak G, Kaushal R, Johnson KB, Ash JS, Bates DW, Block R, Frisse ME, Kern LM, Marchibroda J, Overhage JM, Wilcox AB. "The United Hospital Fund meeting on evaluating health information exchange." *Journal of Biomedical Informatics*. August 2007.

⁵⁴ AHRQ's HIE Evaluation Toolkit is available online through the National Resource Center for Health Information Technology at <http://healthit.ahrq.gov>.

For the handful of states that currently measure HIE progress and health IT adoption, most have focused their efforts on near-term process measures as the table below illustrates.⁵⁵

Measures	Florida	Minnesota	Tennessee
Health IT Adoption: <i>EHR use</i>	✓	✓	
Health IT Adoption: <i>eRx use</i>	✓	✓	✓
Health IT Adoption: <i>Internet access</i>	✓		✓
Data Exchange: <i>Number and types of participants</i>	✓		
Data Exchange: <i>Volume of transactions</i>	✓		

Through funding from an AHRQ State and Regional Demonstration contract, Vanderbilt University Medical Center’s has developed an evaluation framework for HIE built on the following hypotheses:⁵⁶

1. HIE improves the efficiency of care in all care settings, as manifest by:

- Lowering rates of testing (expenses per encounter)
- Lowering rates of admission

As reported by a variety of researchers, HIE is likely to favorably impact the rate of radiology and laboratory diagnostic/therapeutic testing. However, this research literature provides minimal guidance on the definition of redundant tests. A research team at Vanderbilt assessed redundancy based on the stability characteristics of tests. Low stability tests are those whose results could change rapidly such as CBC or EKG. High stability tests are those whose results are unlikely to change rapidly (i.e., if repeated within two weeks) such as HbA1C, HIV or most radiology tests. A test can be categorized as “redundant” if either (a) it is a high stability test that has been repeated too soon, or (b) it is a low stability test that has been normal when last checked.

2. HIE improves the workflow of the environments in which it is used, by

- Reducing time spent seeking information
- Reducing time spent using computer technology during patient care

A key, long-term expectation of HIE is that this tool will enable care services to be rendered as efficiently as possible. Key determinants of efficiency include, but are not limited to, staff-to-patient ratios, the number and complexity of tests and procedures performed for diagnosis and treatment, and the availability of knowledge about treatment the patient has received recently at other facilities. Studies of improved workflow should take into consideration the interrelationship between efficiency of information flow during the process of care and the efficiency with which care is rendered overall.

⁵⁵ SureScripts tracks the number of eRx users at the county level for The Tennessee Office of eHealth.

⁵⁶ Vanderbilt University Medical Center. “Evaluation Plan: Tennessee State Regional Demonstration Project.” 2006.

3. HIE improves the outcomes of specific clinical conditions, as evidenced by

- Increasing the number of patients receiving preventive screenings and immunizations
- Reducing the number of adverse drug events related to errors in medication
- Increasing the number of patients receiving treatment in accordance with recommended, evidence-based guidelines
- Improving health outcomes for patients with diabetes, cardiovascular disease, hypertension and asthma

States are also developing measures around provider and consumer utilization of health IT. In the State of Washington for example, the Health Care Authority (HCA) is using physician and consumer activation measures to assess its health record bank pilot projects. Through these measures, the HCA will ascertain the extent of (1) physicians' use of health records to support patient self-management, and (2) patients' knowledge, skill, and confidence for self-management and the extent to which it is augmented by their use of information in their health record accounts.

In assessing consumer engagement in the health record bank projects, the HCA's evaluation will:

- Survey level of consumer awareness (pre/post)
- Measure number of consumers with health record bank accounts (ongoing tracking)
- Measure amount and type of usage of consumers with health record bank accounts
- Correlate enrollment and usage with other relevant factors (e.g., health status, age, frequency of medical encounters, marketing activities)
- Survey level of consumer trust (pre/post)
- Survey perceived value of HRB (pre/post) including usefulness, comparison to other health care services, and willingness to pay

With respect to providers, the HCA's evaluation will:

- Survey level of provider awareness (pre/post)
- Measure amount and type of usage of HRB data by providers
- Correlate physician usage with other relevant factors (e.g., specialty, health status of patient, frequency of medical encounters, system features)
- Survey level of provider trust (pre/post)
- Survey perceived value of HRB (pre/post) including reliance on HRB information for clinical decisions

Reporting on Progress

In addition to collecting and assessing data, a number of states, most notably Vermont and Minnesota, provide annual reports on their progress.

As required by its authorizing legislation, the Minnesota e-Health Initiative provides an annual update on its progress to the Minnesota legislature. In 2007, the Minnesota e-Health Initiative's *Annual Report to the Legislature* included a report card on its progress against key activities and

the nature and amount of public sector funding.⁵⁷ An illustration of the Minnesota e-Health Initiative’s reporting framework is provided below.

Table 3. MN e-Health Advisory Committee Recommendations for Action							
Summary of Themes and Recommendations for Action Needed to Advance the Statewide Implementation and Use of HIT	Relates to					Proposed Public Funding†	Status Statewide†† (1 Low-4 High)
	Inform practice	Interconnect Care Providers	Personalize care	Improve public health			
Empower Consumers							
1. Accelerate the availability and use of accessible, portable “My Personal Health Record,” with priority given to:							
1a. “My Preventive Health Information” (immunizations, well child screenings) for children and adolescents;			✓	✓	●		2
1b. “My Medication and Health History Information” (“My Clipboard”) for all individuals; and			✓	✓	●		1
1c. “My Care” management tools for individuals with chronic disease (diabetes, asthma, heart disease, cancer).			✓	✓	●		1
Inform and Connect Healthcare Providers							
2. Fund and implement interconnected health information technology statewide, focusing on secure health information exchange in the following priority areas:							
2a. Continuity of Care Records, through secure and timely exchange of patient health histories;	✓	✓	✓		○		1
2b. e-Prescribing;	✓	✓	✓		●		2
2c. Shared information for improved chronic disease management;	✓	✓	✓	✓	●		2
2d. Accessible, complete laboratory result reports with the interpretation of the results; and	✓	✓		✓	●		1
2e. Fully integrate bi-directional immunization data exchange between the registry and EHRs, with centralized decision support from the registry.	✓	✓	✓	✓	●		3
Protect Communities							
3. Improve population health and protect communities through accessible prevention resources, widespread knowledge of community risks, and rapid detection of and response to public health threats, including to:							
3a. Improve the timely detection and electronic reporting of diseases to public health authorities, with timely return of information on community risks and threats.	✓			✓	●		1
3b. *Create and support an integrated state-local Minnesota Public Health Information Network (MN-PHIN) for timely detection of and response to infectious disease and other emergencies.	✓	✓	✓	✓	●		1
†Proposed Public Funding ● = Significant or full reliance on public funding ● = Considerable reliance on public funding ○ = Little reliance on public funding ○ = No use of public funding							
††Status of Statewide Progress on this Recommendation (estimate) 1 = Not started or very limited progress 3 = Widespread progress 2 = Some progress 4 = Statewide achievement of recommendation							

V. CONCLUSION

As described throughout this paper, important lessons learned from the field of state-level HIE development highlight the current readiness of states to advance health IT under the new federal context established by the ARRA. A growing body of knowledge has coalesced about state-level HIT efforts, and models and approaches for implementing state-level HIE infrastructure can now be described. The Project’s ongoing field research and analysis point to state-level HIE efforts as filling a distinct niche serving the public at large, and fostering a new business model for shared information infrastructure that delivers broad societal benefit and provides value to individual data sharing stakeholders. State-level HIE entities are showing themselves to be effective

⁵⁷ Available online at <http://www.health.state.mn.us/e-health/legprpt2007.pdf>.

mechanisms for multi-stakeholder and multi-sector governance; they are also taking on innovative roles as part of the health landscape and HIE marketplace to foster shared investments for interoperability.

Through the state-level HIE efforts that have been described, states are poised to continue and expand efforts to tackle the on the ground implementation challenges that are part of realizing effective nationwide HIE capacity. States await formal program guidance related to the ARRA, however they are intensifying their efforts to organize and execute effective statewide HIE plans, especially given heightened state-level economic pressures and the opportunity to more rapidly advance under opportunities presented by the ARRA. States are considering ways to formulate, revise and advance state plans that will move HIE through implementation to sustainability at a level of scale that will achieve desired impacts on health care and health care system improvements.

Insights from state-level HIE leaders based on state-level HIE development to date, point to the significance of several key issues that should be taken into account as part of both state and federal level strategies:

- HIE development must be linked to achieving quality improvement. Under the ARRA, state-level accountabilities for the use of public funds to accelerate provider adoption and interoperability sharpen the focus on achieving measurable results from HIT and HIE implementation. Threshold issues under the ARRA can help to identify a set of common expectations for HIE implementation across states, along with related implementation milestones, that will enable states to use their leverage for coordinated statewide strategies.
- Effective state-level HIE governance is key to ensuring coordinated versus fragmented and competitive strategies to advance HIE. Comprehensive statewide plans for interoperability will require the practical deployment of ARRA resources and the engagement of multiple public and private stakeholders. The ARRA presents an important opportunity and challenge for states to identify and designate a governance strategy and entity to carry out the role, either within or outside state government. To serve statewide planning and implementation, this entity must be able to carry out a range of governance functions, especially public-private collaboration. As part of statewide strategies and defined plans for both HIT adoption and HIE implementation, state government roles and relationships need to be clarified especially related to those to be played by the Medicaid agency.
- The ARRA can serve as a significant “accelerator” through enhanced financing for statewide plans, HIT adoption, etc. However, important work lies ahead to develop financing strategies that lead to sustainability, taking into account the time frame and structure of ARRA related incentives, but forging workable financing models for sustainable HIE infrastructure that incorporate contributions across stakeholders and sectors. This financing analysis and planning is a key component of state plans, that must incorporate the interplay of local, state and nationwide incentives, value propositions, and financing sources.

ATTACHMENTS

Attachment 1: Summary of State-level HIE Consensus Project

The State-level HIE Consensus Project began in 2006 under a contract from the Department of Health and Human Services Office of the National Coordinator for Health IT. Supported by the Foundation of Research and Education of the American Health Information Management Association, the Project helps understand prevailing strategies, opportunities, and challenges related to these emerging organized, state-level efforts to advance statewide HIE. In particular, the Project is focused on bringing forward relevant formative field research, guiding ongoing HIE development among states, informing federal-level HIE strategies, and helping to align multilevel efforts toward a NHIN.

As its first task, the Project examined nine state-level HIE initiatives at various stages of development; in different regions of the country; and with different state economic, demographic, and healthcare market characteristics. A Steering Committee composed of leaders from these diverse state initiatives led this task, and a series of reports and recommendations were produced to help guide both state and national thinking and HIE development efforts.

The 2006 Final Report synthesized key findings and pointed to valuable and distinct HIE functions taking place at the state level to organize and lead the inherently collaborative business of implementing and managing health data exchange. Barriers to HIE development were identified, including lack of funding, lack of consensus about roles and participation across public and private sectors, and lack of strategic alignment between states and the long-range federal NHIN strategy. Key guidance and points of consensus regarding state-level HIE organizing principles, design features, and other lessons learned about approaches to state-level HIE development were compiled into a Workbook and disseminated as a resource for emerging state-level HIE efforts.

In an extension of its 2006 scope of work through the present, the Project has conducted additional research and produced commentary regarding the relationship of state-level HIE efforts to the emerging nationwide HIE landscape. A State-level HIE Leadership Forum was created in 2008 as a vehicle to solicit engagement and foster shared learning across all state-level HIE efforts, providing a voice from states regarding success factors in building effective statewide HIE. The Steering Committee and now the Forum have emphasized that achieving strategic HIE goals for widespread interoperability is part of a broader agenda for healthcare transformation. Building a HIE infrastructure requires understanding the interplay and structuring alignment of multilevel policy; governance; and operational roles, priorities, and resources. Other specific points included the following:

- Leadership at both state and national levels is required to integrate HIE quality and value initiatives as part of a transformational agenda. State-level HIE entities are poised to play this role.
- Pressures are increasing to understand and establish the key factors influencing the value proposition for HIE sustainability. The Steering Committee highlighted the urgent need to engage and leverage the full participation and support of public and private sectors, especially payers, and showed that this support is vital for defining the value propositions that will achieve HIE sustainability.

Project reports, materials, and contact information are available at <http://www.slhie.org>.

Attachment 1: Summary of State-level HIE Consensus Project



State Level Health Information Exchange Consensus Project STEERING COMMITTEE REPRESENTATIVES

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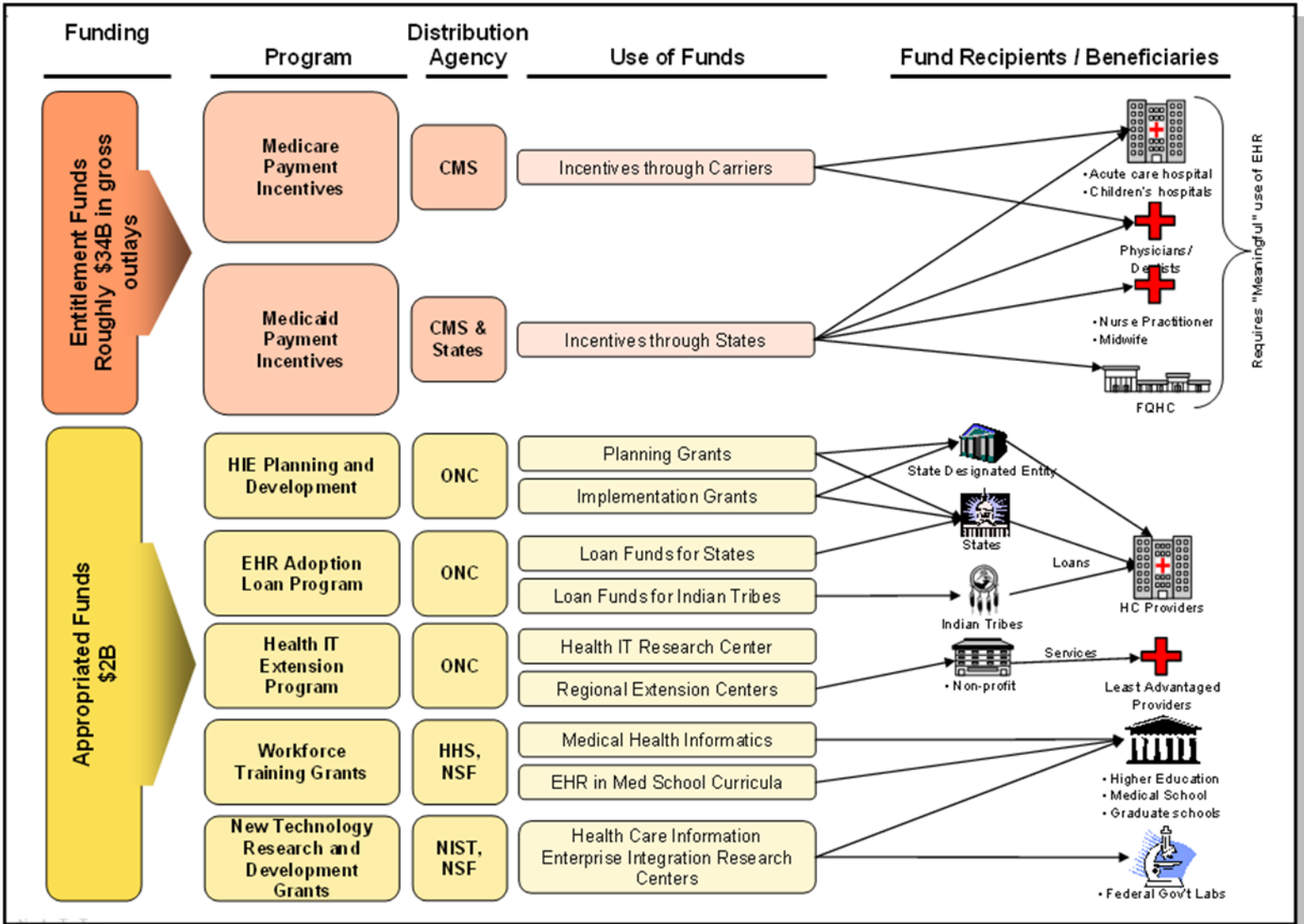
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Attachment 2: Research Contributors and Respondents

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Michigan	Beth Nagel, MA	<i>Health Information Technology Manager</i> Michigan Department of Community Health
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New York	Rachel Block	<i>Executive Director</i> New York e-Health Collaborative (NYeC)
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Attachment 3: Summary of Health IT Funding Provisions in ARRA



Attachment 4: Approaches to Statewide HIE Governance

States typically organize their collaborative process around functional workgroups responsible for recommending policies, standards, technical approaches, and services to the statewide oversight body. The table below illustrates various state approaches.

	Arizona <i>AzHeC</i>	Minnesota <i>Minnesota e-Health Initiative Advisory Committee</i>	New York <i>NYeC's Policy and Operations Council</i>
Privacy and Security	Legal Committee	Privacy and Security Advisory Group	Privacy and Security Work Group
Technical	Clinical/Technical Committee	Standards Workgroup	Protocols and Services Work Group
Clinical	Clinical/Technical Committee	N/A	Clinical Priorities Work Group
Health IT Adoption	e-Prescribing Steering Committee	Effective Use of EHRs Workgroup; e-Prescribing Workgroup	EHR Collaborative Work Group
Education and Outreach	Education and Outreach Committee	Communications Advisory Workgroup	Education and Communication Committee
Consumer	Consumer Advocacy Committee	N/A	Consumer Advisory Council
Budget/Finance	Budget/Finance Committee	N/A	Financial Sustainability Work Group
Membership	Membership Committee	N/A	N/A

Typically, the workgroups support the convening and analysis activities and consist of representatives from the provider, consumer, patient advocacy, health insurer, and local HIE communities. The workgroups can be staffed and supported by representatives from the statewide governance entity, state government, and/or subject matter experts retained on contract.

For illustration purposes, a description of the roles and responsibilities for participants in New York's statewide collaborative process is described below:

Workgroup Chairs/Vice-Chairs

- Call and facilitate meetings
- Foster consensus among workgroup participants to make decisions
- Resolve issues and disagreements, or if unresolved refer them to the oversight body
- Work with staff consultants to develop agendas and meeting materials
- Work with staff consultants to develop project plans
- Create subgroups to work on specific areas as necessary
- Where appropriate request liaisons from other workgroups
- Arrange to provide liaisons from own workgroup
- Lead workgroup in its review of other workgroup products
- Lead discussion for providing final disposition on public comments

Attachment 4: Approaches to Statewide HIE Governance

Workgroup Members

- Regularly attend meetings and actively participate in work efforts, including subgroups
- Communicate workgroup activities and decisions back to their organizations
- Represent their organizations; bring issues and feedback forward from their organizations
- Comply with workgroup decisions and fully integrate workgroup products into implementation plans
- Accept and complete action items from chair to advance progress of workgroup
- Represent the opinions of their workgroups at those meetings
- Provide regular progress reports to their workgroups

Workgroup Staff and Consultants

- Develop agendas and meeting materials with Chairs
- Develop and manage project plans, including deliverables, milestones and timelines, in coordination with chairs
- Support meeting facilitation
- Ensure compliance with workgroup policies and procedures
- Draft policies and develop work products
- Keep minutes, record action items and decisions
- Maintain workgroup membership lists
- Submit monthly reports to oversight body on workgroup progress
- Log comments provided during public comment period and document formal disposition

Attachment 5: Use Cases and Value Propositions

Network designers typically utilize use cases to guide IT system development. Use cases describe what a system (or systems) needs to do to achieve a specific mission or stakeholder goals. Use cases identify relevant stakeholders, information flows, issues, and systems needs that apply to the multiple organizations participating in these specified data exchanges.

With respect to health IT, use cases have guided the development of HIE efforts at the national, state, and local levels. At the national level, the American Health Information Community defined and the HHS Secretary accepted a series of use cases that would be supported by the Nationwide Health Information Network.⁵⁸ The federal government utilizes the approved use cases to advance standards harmonization, define architecture specification, inform certification consideration, and provide the framework for detailed policy discussions to advance the national health IT agenda.

The table below identifies the key functionalities and documented benefits of the eight most common use cases addressed by HIEs.

Use Case	Details
1. Diagnostic Results Reporting	<p>Definition: Allow a clinician to electronically obtain diagnostic results (including laboratory test results, radiology reports, and pathology reports) that he or she has ordered and to electronically obtain relevant test results for the purpose of the clinical care of a patient.</p> <p>Functionality: The delivery of diagnostic results on a “push” basis to a targeted set of recipients (e.g., the requesting physician).</p> <p>General Benefits:</p> <ul style="list-style-type: none"> • Workflow efficiency for providers as they can go to a single location to retrieve clinical messages from multiple sources/systems. • Reduce costs for delivering results over traditional methods (e.g., fax, mail, courier). • Allow hospitals to eliminate redundant clinical results delivery services. • Reduce unnecessary testing. • Serve as a platform to enable the push of other types of information to physicians (e.g., public health alerts).

⁵⁸ Additional details on the Nationwide Health Information Network are available online at <http://www.hhs.gov/healthit/healthnetwork/background/>.

Attachment 5: Use Cases and Value Propositions

Use Case	Details
2. Medication Management	<p>Definition: Medication Management Services provide medication history retrieval and aggregation from multiple sources, Medicaid and insurance eligibility checks, formulary queries, and e-prescribing functionality.</p> <p>Functionality: Via an EHR or portal, authorized clinicians will be able to (1) determine patient eligibility; (2) download the appropriate formulary file for patient's coverage plan; and (3) search for patient's medication history across multiple records and aggregate into a single view, providing clinician additional patient medication information including Allergy/Drug Sensitivity, Condition Information.</p> <p>General Benefits:</p> <ul style="list-style-type: none"> • Reduce adverse events due to med errors and related hospitalizations. • Reduce narcotics fraud and medication seeking. • Reduce unnecessary hospitalizations. • Increase formulary compliance. • Increase administrative efficiencies by reducing calls for clarification, renewal, and eligibility. • Increase generic substitution.
3. Transfer of Care	<p>Definition: Defined by the American Health Information Community in March 2008, the Transfer of Care use case describes the information flows, issues and system capabilities that apply to a provider requesting a transfer of care for a patient and the receiving facility admitting the patient.</p> <p>Functionality: This use case focuses on providing patient information needed by clinicians to accomplish a transition in care from one care setting to another. The focus is on transitions between acute, long-term care, nursing facility, rehabilitation facility, home healthcare, and other inter-organizational transitions rather than transfers within a given care setting.</p> <p>The transferring setting can transmit a core set of clinical information to the receiving setting to assist in the coordination and management of patient care and may also send relevant information to the patient's personally controlled health records.</p> <p>General Benefits:</p> <ul style="list-style-type: none"> • Clinicians benefit from more comprehensive and usable health information with which to coordinate and improve care, minimize medical errors and costs, and maximize efficiency. • Patients benefit from greater continuity and quality of care during consultations with providers and transitions between care settings.

Attachment 5: Use Cases and Value Propositions

Use Case	Details
4. Quality Reporting	<p>Definition: The technical capacity and functionality needed to measure and report on hospital and clinician quality and use quality measures to support clinical decision making.</p> <p>Functionality: Quality Reporting supports the capture and reporting of quality, performance, and accountability measures to which providers, facilities, delivery systems, and communities are held accountable including measures related to process, outcomes, and/or costs of care, may be used in 'pay for performance' monitoring and adherence to best practice guidelines.</p> <p>General Benefits:</p> <ul style="list-style-type: none"> • Greater efficiency and cost savings associate with submitting, collecting, and analyzing data. • Reduce delays in the provision of performance data to physicians.
5. Research	<p>Definition: Query either a centralized repository or multiple data sources to produce a de-identified report for an approved research project.</p> <p>Functionality: Access to aggregated patient care data provides an opportunity to improve clinical research, recruitment for clinical trials, and comparative effectiveness efforts.</p> <p>General Benefits:</p> <ul style="list-style-type: none"> • Enables better identification of previously undetected patterns of safety events and/or co-morbidities. • Improves timeliness and effectiveness of post-market surveillance of drugs and medical devices.
6. Public Health	<p>Definition: Transmit essential ambulatory care and emergency department visit, utilization, and lab result data from in standard and anonymized format to authorized public health agencies.</p> <p>Functionality: This use case can support reportable disease investigation, influenza surveillance, etc.</p> <p>General Benefits:</p> <ul style="list-style-type: none"> • Improves ability to identify and respond to public health threats. • Improves timeliness and completeness of automated reporting vs. paper-based methods.
7. Community Resource Management	<p>Definition: The ability for hospitals to transmit capacity and availability data (including institution, unit-level census, and facility utilization data) to Public Health Agencies.</p> <p>General Benefits:</p> <ul style="list-style-type: none"> • Reduces cost of resource management. • Builds on existing disaster management applications.

Attachment 5: Use Cases and Value Propositions

Use Case	Details
8. Consumer Empowerment	<p>Definition: According to the Health Information Technology Standards Panel, the Consumer Empowerment and Access to Clinical Information via Networks Interoperability Specification defines specific standards needed to assist patients in making decisions regarding care and healthy lifestyles (i.e., registration information, medication history, lab results, current and previous health conditions, allergies, summaries of healthcare encounters and diagnoses).</p> <p>Functionality: Includes the capabilities to: (1) share information with designated entities; (2) patient care management tools; and (3) conduct routine health scheduling and administrative functions (e.g., pre-registration).</p> <p>General Benefits:</p> <ul style="list-style-type: none"> • To the extent the patient shares his/her views of their data with providers, increases quality, safety, and effectiveness likely to ensue. • Heightened patient engagement in care. • Complementary tool for improved chronic disease management. • Administrative efficiencies in accessing care (e.g., scheduling and registration).

The table below assesses the extent to which each the eight most common use cases meet the following criteria for ascertaining the preferred sequence of implementation:

- 1) Magnitude of clinical value
- 2) Magnitude of efficiency improvements
- 3) Ease of integrating with existing workflows

Use Case	Improvements		Integration Ease	Comments
	<i>Clinical Value</i>	<i>Efficiency</i>		
Diagnostic Results Reporting	Low	High	High	<p>+ Proven business case amongst operational HIEs</p> <p>+ Higher ease of adoption within provider community relative to other use cases</p> <p>- Clinical value lower than other use cases⁵⁹</p>

⁵⁹ If the Diagnostic Results Reporting use case is expanded to provision results to non-ordering clinicians, its clinical value would increase.

Attachment 5: Use Cases and Value Propositions

Use Case	Improvements		Integration Ease	Comments
	Clinical Value	Efficiency		
Medication Management	High	Moderate	Moderate	<ul style="list-style-type: none"> + Proven clinical and administrative benefits + Included in early phases of many HIEs + Links to existing incentives for eRx adoption + Potential to leverage this use case to satisfy facilities' medication reconciliation requirements
Transfer of Care	Moderate	Moderate	Low	<ul style="list-style-type: none"> + Significant potential for both clinical and administrative efficiencies - Requires significant workflow modifications - Many long term care facilities, a key stakeholder for realizing clinical value and efficiency, lack the capabilities to accept and exchange data and participate fully in this use case.
Public Health	High	Moderate	Moderate	<ul style="list-style-type: none"> + Ability to leverage ongoing and future federal/state investments in public health. - Adoption slowed by public health's reliance on mandates (vs. incentives) to support reporting. - While the benefits of automated reporting have been demonstrated, public health departments will require significant investments in business intelligence tools to organize and analyze data quickly and effectively.
Community Resource Management	Moderate	High	Moderate	<ul style="list-style-type: none"> + Ability to leverage ongoing and future federal/state investments in biosurveillance. + Compatibility with existing ED diversion efforts in many states. - Adoption stymied by public health's reliance on mandates to support reporting as opposed to incentives.

Attachment 5: Use Cases and Value Propositions

Use Case	Improvements		Integration Ease	Comments
	Clinical Value	Efficiency		
Quality Reporting	Moderate	Moderate	Low	<p>+ Quality reporting requirements will be a growing feature of healthcare reimbursement</p> <p>- In ability of providers to obtain timely feedback remains significant hindrance for integration into clinical workflows.</p>
Consumer Empowerment	Moderate	Unproven	Low	<p>- Business case for consumer empowerment remains elusive.</p> <p>- Poses significant challenges for workflow integration for healthcare providers.</p>
Research	Unproven	Unproven	Low	<p>+ Maryland, with the presence of prominent national research facilities, has opportunity to stimulate interest in this use case.</p> <p>- While academic institutions and IDNs continue to build data sets for research, there have been few studies proving the clinical value of heterogeneous data sets for research.</p> <p>- Monetization of clinical data based on HIEs has not been achieved.</p> <p>- Requires high degree of data availability in order to yield value.</p>

Attachment 6: Technical Models for Statewide HIE

While the promise of shared services is widely embraced, the options for bringing full interoperability to scale vary and are influenced by the configurations of health care providers, purchasers, payers and supporting organizations, which can differ significantly from state to state. Moreover, each state poses a range of existing and emerging exchange networks that state-level HIEs must contend with, including local exchanges, integrated delivery networks, aggregators of data for public health and quality purposes, clearinghouses, disease registries, regional and national data processors, and Chartered Value Exchanges.

In these complex environments, state-level HIEs struggle to array resources and prioritize technical implementation. Though approaches continue to evolve and adapt to changing conditions, three broad technical alternatives are emerging to achieve statewide interoperability:

- (1) an approach focused on the creation of a centralized technical infrastructure that directly links all health care entities,
- (2) a model reliant on Regional Health Information Organizations (RHIOs) as governance entities overseeing the implementation of common HIE policies, standards, and protocols,
- (3) and a network of “health record banks” through which patients’ directly control access to their health information.

Each model is described in greater detail below, and it is important to note that while some state-level HIEs can be categorized into one of the three alternatives, others are blending elements of all three and adapting the models to suite their specific circumstances.

Model 1. Core services managed centrally to connect healthcare entities. A number of state-level HIEs are developing centralized technical approaches designed to create a common infrastructure that minimizes the number of interfaces for data providers and users, and thereby may reduce overall development costs for statewide interoperability.

In this model, entities and local HIEs connect to the statewide utility through specified interfaces and protocols. The technical architecture of the individual entities or smaller HIEs do not need to be the same as that of the statewide utility, because many of the statewide architecture components would not be needed at the local level.

When operating in a single or relatively few distinct medical trading areas, a state-level HIE effort contends with less RHIOs and HIEs. With a more manageable volume of stakeholders and recognizing opportunities for economies of scale, state-level HIE initiatives in Vermont, Delaware, Rhode Island, Maine, and Utah have organized their efforts around a single, designated entity that combines both the governance and technical operations functions.

Attachment 6: Technical Models for Statewide HIE

The Table below highlights the technical objectives of state-level HIEs in less populous states.

State	Population Estimate ⁶⁰	State-level HIE Initiative	Technical Implementation Goals
Vermont	621,254	Vermont Information Technology Leaders	<ul style="list-style-type: none"> • Phase 1: Medication histories to Emergency Departments • Phase 2: Chronic Disease Management
Delaware	864,764	Delaware Health Information Network	<ul style="list-style-type: none"> • Phase 1: Clinical results/reports delivery & Public Health reporting • Phase 2: Med and patient histories, eOrders, patient portal, enhanced Public Health reporting • Phase 3: Physician workflow management and administrative functions
Rhode Island	1,057,832	Rhode Island Quality Institute	<ul style="list-style-type: none"> • Phase 1: Medication and lab histories via secure, Internet-based portal • Phase 2: TBD
Maine	1,317,207	HealthInfoNet	<ul style="list-style-type: none"> • Phase 1: Patient ID & demographics, encounter histories, lab and radiology results, patient consent management via secure, Internet-based portal • Phase 2: Adverse reactions/allergies, medication history, diagnosis/conditions/problems, dictated/transcribed Documents
Utah	2,645,330	Utah Health Information Network	<ul style="list-style-type: none"> • Phase 1: Administrative data delivery • Phase 2: Clinical results delivery

In more populous states, facilitating HIE is complicated by the increased costs and technical challenges of serving larger populations, multiple payer and provider systems built around distinct regional referral patterns, and evolving HIEs. These state-level HIEs face difficult decisions regarding the degree to which they offer services centrally or allow services to be hosted by organizations on the “edges” of the infrastructure.

2. Statewide interoperability through local HIEs and shared services. Instead of achieving interoperability by linking all entities directly with a single state-level HIE utility, Michigan and New York are pursuing distributive networking strategies based on local HIEs deploying technical architecture and services that conform with common statewide policies, standards, and protocols.

In this model, smaller, more localized HIEs may develop within networked organizations in the state, such as a hospital network for its local service area. This architecture recognizes that smaller HIEs could function, and would be able to interoperate with the other networks as long as they comply with the agreed upon standards through compliant interfaces.

This model is predicated on the ability of local HIEs to develop and support connectivity for stakeholders in their respective regions. The local HIEs tend to represent medical trading areas (MTA), the natural market within which most referrals, hospitalizations, and other flows of both patients and patient information typically occur. It is an area in which clinicians and healthcare organizations work together

⁶⁰ 2007 Census Bureau estimates.

Attachment 6: Technical Models for Statewide HIE

to serve a population of consumers, and where working relationships have typically already been established in serving common patients. The MTA is the geographic area in which face-to-face trust can most readily be established and within which the bulk of information is currently exchanged (usually on paper) on a daily basis.⁶¹

In New York, stakeholders are working collaboratively through the New York eHealth Initiative to identify commonly-used “shared” services and avoid the costly proliferation of redundant and incompatible services.⁶² The State-wide Health Information Network (SHIN-NY) will provide the technical health information infrastructure that supports New York’s broader healthcare goals to improve the quality and efficiency of healthcare. The SHIN-NY will be comprised of standardized regional sub-networks or HIEs governed by Regional Health Information Organizations (RHIOs) through contracts with health information service providers and vendors.

The SHIN-NY will also include state-level services through which the regional HIEs communicate and share services, governed by RHIOs and NYeC. The regional sub-networks or HIEs and the state-level services will communicate through a service-oriented architecture using web services and common health information exchange protocols.⁶³

Model 3. Interoperability through Health Record Banks. In Washington and Oregon, state-level HIE efforts are building the governance, technical, and business frameworks to create and sustain a system of health record banks. Health record banks would serve as designated repositories of consumers’ health information, and consumers would grant permission for authorized health providers to deposit data to or access their health records.⁶⁴

While pilot demonstrations have just begun in Washington, stakeholders in both states continue to explore the implications and considerations of a state model based on health record banks. In December 2006, the Washington Health Information Infrastructure Advisory Board submitted its final report, *Washington State Health Care Authority Health Information Infrastructure: Final Report and Roadmap for State Action* that recommended the creation of a network of Health Record Banks (HRBs).

According to this model, HRBs serve as entities where consumers may choose to store their health records. A central account locator service will ultimately be established to keep track of which HRB holds the record for each consumer. When the record is needed for care, the consumer provides access information for the record (i.e., the name of his or her bank and account number). The consumer record is then obtained directly from the applicable HRB. When the care is completed, a copy of the information is sent directly to the consumer’s HRB for aggregation with the existing health record.

⁶¹ Arizona Health-e Connection Roadmap, http://gita.state.az.us/tech_news/2006/Arizona%20Health-e%20Connection%20Roadmap.pdf, accessed on October 31, 2006.

⁶² New York Department of Health. “Architectural Framework for New York’s Health Information Infrastructure.” Available online at http://www.health.state.ny.us/technology/projects/docs/technical_discussion_document.pdf.

⁶³ Statewide Health Information Network for New York (SHIN-NY) Technical Architecture Overview V1.0 – DRAFT. November 3, 2008. Available online at http://www.nyehealth.org/files/File_Repository16/pdf/SHIN-NY_TechArch_20081125.pdf.

⁶⁴ Additional details on Washington’s and Oregon’s support of health record banks are available online through the *AccessMyHealth* (<http://www.accessmyhealth.org/>) and the Health Information Infrastructure Advisory Committee (<http://www.oregon.gov/OHPPR/HIIAC.shtml>) respectively.

Attachment 7: Financing Models for Statewide HIE

Federal Sources

Federal investments in HIE have focused on policy coordination, privacy and security, technical standards and certification, and discrete demonstration projects. Federal funding for state-level HIEs have been made through grants and contracts, or through leveraging of the federal matching portion of Medicaid information technology systems.

While leveraged by a handful of state-level HIEs, federal contracts and grants have limited availability and are driven by the particular objectives of the sponsoring federal agency, which may not align with the needs of state-level HIE initiatives. In addition, states' efforts to consolidate health IT capabilities or create shared functionality are often hindered by rules that limit the use of federal funds beyond their originally intended purposes.

The federal government also supports the development of IT capabilities through ongoing support for the Medicaid program's claims processing systems, the Medicaid Management Information Systems (MMIS). State Medicaid agencies can leverage MMIS funding to advance statewide HIE efforts. The nature and implications of using federal or state Medicaid funding to support state-level HIE is governed by federal matching laws.⁶⁵

The table below highlights the range of federal and state financial participation across state-level HIE deployment scenarios.⁶⁶

Medicaid- State-level HIE Relationship	Eligible Activities (<i>State Portion</i>)	Eligible Activities (<i>Federal Portion</i>)	Examples
Medicaid operates statewide HIE	HIE development costs <i>(state share 10%)</i>	HIE development costs <i>(federal share 90%)</i>	A Medicaid Agency designs, builds, and operates HIE hardware and software. The Medicaid Agency permits access to its data by others.
	Ongoing administrative costs <i>(state share 25%)</i>	Ongoing administrative costs <i>(federal share 75%)</i>	Note: Non-Medicaid agencies and entities must pay for their linkages to Medicaid operated HIE.
Medicaid contracts with State-level HIE to operate services	Ongoing administrative costs <i>(state share 25%)</i>	Ongoing administrative costs <i>(federal share 75%)</i>	A Medicaid Agency contracts with a state-level HIE to provision Medicaid data to providers. The Medicaid Agency pays the state-level HIE a per member-per month or transaction fee.

⁶⁵ As a general rule, the federal government match for Medicaid administrative expenditures is 50 percent; however, the match can be higher for certain administrative functions. In fact, for the design, development, and installation of MMIS, the federal match is 90 percent, and for ongoing operational maintenance, the federal match is 75 percent.

⁶⁶ *State Medicaid Agencies' Initiatives on Health Information Technology and Health Information Exchange*, U.S. Department of Health and Human Services, Office of Inspector General (August 2007). Available online at <http://www.oig.hhs.gov>.

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Medicaid- State-level HIE Relationship	Eligible Activities (<i>State Portion</i>)	Eligible Activities (<i>Federal Portion</i>)	Examples
Medicaid contracts with entities to participate in State-level HIE	Programmatic costs (<i>state share 50%</i>)	Programmatic costs (<i>federal share 50%</i>)	Through a P4P program, a Medicaid Agency reimburses physicians who participate in the state-level HIE at a higher rate.

While CMS officials recently indicated that states have yet to exercise the MMIS financing mechanism to support state-level HIE, a number of states are reportedly working with CMS and their state Medicaid agencies to explore these options.

As MMIS systems continue to modernize and become more visible parts of a state’s HIE portfolio, state governments and state-level HIEs will have to negotiate and navigate technical, policy, and governance relationships at the provider, regional, and state levels.

State Government

Recognizing the potential of HIE to improve the cost, safety, and effectiveness of care, state governments have steadily increased their investments in HIE in recent years, drawing on a mix of capital and operating budgets, assessments, and special purpose funds.

Operating Budgets. State operating budgets include expenditures for a single period of appropriations, either annually or biannually. Across the country, most state-level HIEs have received funding from their state’s operating budgets. However, reliance on the legislative budget and appropriation process can prove a precarious strategy. Largely dependent upon revenues which can fluctuate year-to-year, state’s operating budgets are also subject to balanced budget requirements that often put funding for discretionary programs at risk during economic downturns.

Capital Budgets. In 40 states, capital financing mechanisms can be utilized for infrastructure investment needs.⁶⁷ States issue the bonds to investors with the promise to repay the debt either through the state’s taxing authority or the revenue generated from the projects supported by the bonds.

Capital funding has been successfully used in a number of states to support statewide health IT projects. In Rhode Island, the state established a \$20 million revenue bond to create a statewide HIE capacity. The revenue bond is contingent on proportional contributions from stakeholders, including State government and the private health plans.

Unlike operating budgets, capital budgets typically provide greater balance between revenue and expenditure flows. However, capital budgeting faces a number of implementation challenges and potential delays: they typically require legislative approval and the creation of fund disbursement mechanisms. Moreover, state-level HIE projects often must compete for a limited, and shrinking, pool of funds against better understood and more traditional capital projects.

Special Purpose Funds. “Special purpose funds” refer to funding sources that are not subject to the traditional legislative appropriation process. Examples of special purpose funds include tobacco settlement funds and federal Medicaid waivers.

⁶⁷ Reed, B. J.; Swain, J.W. *Public Finance Administration*. Sage Publications, Thousand Oaks, CA, 1997.

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In June 2007, Connecticut enacted House Bill 8001 that allocated the transfer of a total of \$1 million over two years from the Tobacco and Health Trust Fund for the Connecticut Health Information Network (CHIN).⁶⁸

In addition to tobacco settlement funds, states have also utilized CMS funding through Medicaid Section 1115 waivers to support health IT adoption and HIE development. Section 1115 of the Social Security Act is a broad demonstration authority that allows the Secretary of HHS to permit a state to use federal Medicaid matching funds to pay for expenditures that would otherwise not be allowable under the Medicaid statute (Title XIX of the Act).⁶⁹

Funds for New York's Health Information Infrastructure derive from special purpose funding from a Waiver called the Federal-State Health Reform Partnership (F-SHRP). Effective October 1, 2006, the Centers for Medicare and Medicaid Services (CMS) approved New York's five-year F-SHRP Demonstration Waiver to reform New York's Medicaid program.

In accordance with the terms of the waiver, New York must invest \$3 billion over the five-year demonstration in healthcare reform initiatives in order to receive \$1.5 billion in federal funding. New York can allocate funding for reform initiatives that promote the efficient operation of the State's healthcare system; right-size New York's acute care system; shift long term care system from institutional to community care; expand e-prescribing, EMRs and RHIOs; and improve ambulatory care.

As part of its matching commitment to the F-SHRP demonstration, the State of New York has leveraged its capital budgeting authority to award over \$158 million to advance a statewide health information network.

Special Assessments. In some respects, special assessments resemble taxes. The primary objective of the special assessment, as in the case of taxes, is to advance a common benefit.⁷⁰ Unlike taxes, which are paid without reference to specific individual benefits, special assessments are created for specific purposes. In order to support its state-level HIE efforts and health IT adoption plans, Vermont used a special assessment to create the Vermont Health IT Fund.

In April 2008, the Vermont passed legislation to create the Vermont Health IT Fund. Drawn down in annual increments by Vermont's state-level HIE, the Vermont Information Technology Leaders, the Vermont Health IT Fund will be used to support both statewide HIE and the adoption of certified Electronic Health Records.

Beginning Oct. 1, 2008, each health insurer operating in Vermont began paying a quarterly fee into the fund. Insurers can choose between paying 0.199% of all healthcare claims paid for their Vermont members in the previous quarter, or a fee based on the insurer's proportion of overall claims in the past year, as calculated by the Vermont Department of Banking, Insurance, Securities and Health Care Administration. Medicaid is making a voluntary annual contribution of approximately \$250,000 per year.

The process to collect funds from payers is being developed through the Vermont Department of Banking, Insurance, Securities and Health Care Administration's rule making authority. Vermont's

⁶⁸ The CHIN is a partnership between the Univ. of Connecticut, Akaza Research, Inc., and Connecticut's state agencies to link diverse databases across agencies. Details available at <http://publichealth.uconn.edu/CHIN.php>.

⁶⁹ These expenditures can be for populations not otherwise allowable, services not otherwise allowable, or both.

⁷⁰ Hunter, Merlin H. "Outlines of Public Finance." 1921. New York, London, Harper & Brothers. Full text available online at <http://www.archive.org/details/outlinesofpublic00huntrich>.

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Health Care Information Technology Reinvestment Fee is expected to raise a total of approximately \$32 million over the next seven years.

Philanthropic Sector

Philanthropies have been a significant source of start-up investments for state-level HIE capacity building. Much like the public sector, philanthropies recognize the potential social value that interoperable HIE presents.

In many states, foundations have provided critical funding to incubate the planning and governance functions of state-level HIE initiatives. In California, CalRHIO has received nearly \$2.5 million in total from the Blue Cross of California Foundation, the Blue Shield of California Foundation, the California Health Care Foundation, and the Blue Shield Foundation of California.

Charitable organizations, like state budgets, are subject to changing economic conditions. Charitable contributions are highly correlated with stock prices, and contributions can lag or fluctuate significantly during periods of poor market conditions.

Private Sector

In order to support their capital investment needs, a number of state-level HIEs have turned to funding sources in the private sector, including providers, payers, and even vendors and financial institutions. A key distinction between public and private financing is that the pressure to return value to private sector stakeholders is more acute in the near term than the demands of public and non-profit investors.

Providers. As noted above, hospitals and physician practices have significant limitations in their ability to bear the capital costs of statewide HIE development. In addition, the recent economic downturn puts additional pressure on providers to reduce costs.

Even hospitals with positive cash flows have challenges amassing the capital internally to make large IT investments, and when they do invest in health IT, it is aligned to support the hospital's organizational needs. As a result, IT investments tend to focus on internal, tactical operational needs while funding for participation in and support of HIE are often lower strategic priorities.

The ambulatory provider market, which delivers almost 90% of the primary care in the United States, has very limited access to capital. Though some larger practice groups have invested in health IT for strategic advantage, most have been slow to adopt health IT, and very few have engaged in community-based HIEs despite the increasing availability of incentives.⁷¹

Payers. As the stakeholder segment expected to derive the greatest value from interoperability, payers have traditionally been seen as a source of capital for state-level HIE efforts. In Rhode Island, for example, the Rhode Island Quality Institute (RIQI) has proposed a "Cost of Care Model" that supports both capital and operating needs and relies on funding from health insurers. According to this model, insurers would pay a percentage of the annual capital and operating needs based on their percentage of covered lives in the state.

⁷¹ Grossman, JM and Cohen, G. "Issue Brief: Despite regulatory changes, hospitals cautious in helping physicians purchase electronic medical records." *Center for Studying Health System Change* (September 2008). Available online at <http://www.hschange.com/CONTENT/1015/>.

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Models based on payers must take into consideration the participation of non-domiciled health plans. If the non-domiciled insurers are not mandated to pay for their members' use of the HIE, or if they increase their premiums to account for their participation, the domiciled insurers could be at a price disadvantage.

Vendors. A number of HIEs have successfully leveraged partnerships with technology vendors to secure funding or in-kind contributions to advance implementation. In Texas, leaders of the state-level HIE effort are exploring the viability and applicability of a unique financing arrangement for statewide HIE services that relies exclusively on financing from technology vendors. The financing approach is modeled after the development and operations of *TexasOnline*.⁷²

While the vendor-financed model is untested in the context of state-level HIE, it is becoming an increasingly attractive financing mechanism in light of the anticipated budget shortfalls in the public sector. The State of Florida is considering a variation to this approach, whereby a no-cost contract would be released calling for a vendor to provide Medicaid claims and medication history services statewide.

Financial Institutions. Financial institutions have long been a source of capital for complex infrastructure projects in which initial development costs exceed the corresponding near term receipt of revenue. In contrast to public and philanthropic investments, the private capital market typically operates on calculus of revenue and risk. Financial institutions can cover the initial start-up costs through "equity," i.e., purchasing an ownership stake in the organization, or through a "debt" mechanism, i.e., providing a loan.

As most entities overseeing and maintaining state-level HIE operations are not-for-profit entities, financial institutions have little incentive to take equity positions in these organizations. Debt instruments, on the other hand, may offer an attractive vehicle to funders.

In California, the statewide HIE entity, the California Regional Health Information Organization (CalRHIO), is working on a financing strategy that proposes to leverage health plans' willingness to pay for HIE services as collateral for debt from private equity investors. CalRHIO is developing a statewide utility based on a service-oriented architecture, through which authorized and authenticated providers can query the network and receive patient-centric information. In its initial phase, CalRHIO will facilitate the delivery of medication histories and laboratory results to Emergency Departments.

CalRHIO's business model is predicated on three principles:

1. Health information exchange should be a public utility that maximizes benefit to the citizens of California.
2. Health information exchange can be established by a public-private partnership utilizing private funds to finance the development and initial deployment of HIE services; this does not require initial investment from the state, health plans, hospitals, providers, employers, or CalPERS.
3. The long-term sustainability of HIE depends upon financial support from all participating entities that is proportional to the financial benefits received.

In April 2008, the California Public Employees' Retirement System (CalPERS) directed its current health plans – Anthem Blue Cross, Blue Shield of California and Kaiser Permanente – to negotiate contract

⁷² *Innovative Funding for Innovative State IT: New Trends and Approaches for State IT Funding Version 2.0*. National Association of State Chief Information Officers (November 2003). Available online at <http://www.nascio.org/publications/documents/NASCIO-FundingReport2003.pdf>.

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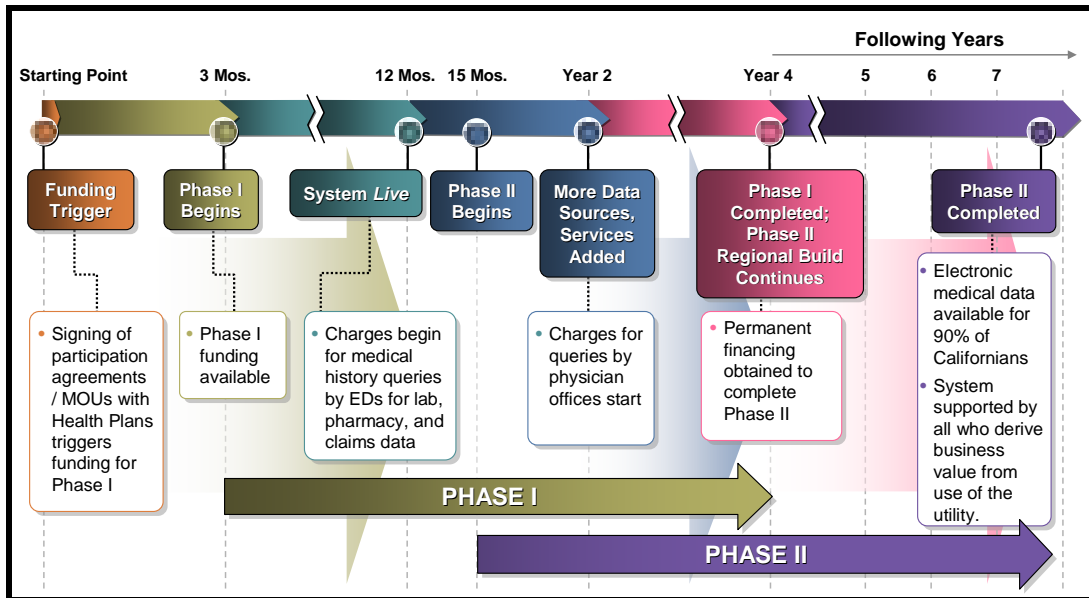
terms with CalRHIO. Because health plans and their members are projected to be the primary beneficiaries of the benefits derived from accessing patient data, health plans are being asked to pay for the information delivered in Phase 1. Charges will be generated only when data are returned and will appear as part of the ED claim.

CalRHIO estimates that it will require \$11 million to complete Phase 1, which will allow Emergency Room physicians in 90% of California’s hospitals to access patients’ medical histories, lab, pharmacy, and claims data. Funding for Phase I will be through private equity based on the ability of CalRHIO to secure commitments from at least three major health plans in California to participate in the CalRHIO HIE initiative. This gating factor is intended to ensure a clinically robust and relevant data set which will drive user adoption, secure an adequate value proposition for participants, and deliver a positive return on the investment.

Round 2 funding will commence upon successful completion of Phase 1 of the technology development, which is estimated to occur at the end of year 4. These funds are expected to be composed of tax-exempt funding i.e., bonding financing. This approach will allow CalRHIO to continue operating as a non-profit utility for all the California healthcare community and complete integration with local/regional EHR systems such that 90% of all Californians will have a record in the system.

By dividing the task into two components—a Statewide On-Demand Information Service (consolidating easily obtained statewide data feeds) and a Regional On-Demand Information Service layer (extracting all sources of patient clinical data in a locality)—CalRHIO can leverage initial financing towards building a revenue engine capable of funding the remainder of the network build-out.

An overview of CalRHIO’s proposed implementation approach and timeline is provided on the following page.



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Note: This table is always evolving to reflect work in progress. Check www.slhie.org for updated versions.

State	Name, Sponsor, Author	Date Released	# of Pages	URL
Arizona	<p>Title: Arizona Health-e Connection Roadmap</p> <p>Sponsor(s): St. Luke's Health Initiatives and BHHS Legacy Foundation</p> <p>Author(s): eHealth Initiative</p>	Apr 4, 2006	80	http://www.azgita.gov/tech_news/2006/Arizona%20Health%20Connection%20Roadmap.pdf
California	<p>Study/Report Name: <i>California Health Information Technology Study: Input to the California Health Data Exchange</i></p> <p>Sponsor(s): UnitedHealth charitable contribution, the State agencies of Health and Human Services and Business, Transportation, and Housing, the State Chief Information Officer, and the Department of Managed Health Care.</p> <p>Author(s): Accenture</p>	Jan 1, 2007	73	http://www.dmhc.ca.gov/library/reports/news/CA%20HIT%20Study%202007.pdf
Colorado	<p>Study/Report Name: Colorado Regional Health Information Exchange Business Plan, Appendix, Financial Plan Supplement</p> <p>Author(s): Strategies for Tomorrow</p>	December 2008		Not publicly released. For information contact palbritton@pcubedpartners.com
Colorado	<p>Study/Report Name: Colorado Regional Health Information Exchange Business Plan</p> <p>Sponsor(s): Colorado Health Institute and grant from the HHS Office for the Advancement of Telehealth, Health Resources and Services Administration</p> <p>Author(s): Holme Roberts & Owen LLP</p>	Feb 23, 2006	109	http://www.corhio.org/docs/business/02_23_06_CORHIOBusinessPlan.doc

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
Colorado	<p>Study/Report Name: The Promise of Health Information Technology: Improving the Quality and Cost Effectiveness of Patient Care in Colorado: White Paper</p> <p>Sponsor(s): Colorado Health Institute</p> <p>Author(s): Colorado Health Institute</p>	Nov 1, 2004	21	http://www.coloradohealthinstitute.org/Documents/HIT_White_Paper.pdf
Florida	<p>Study/Report Name: Final Report of the Governor’s Health Information Infrastructure Advisory Board</p> <p>Sponsor(s): Governor’s Health Information Infrastructure Advisory Board</p> <p>Author(s): Governor’s Health Information Infrastructure Advisory Board</p>	Jul 6, 2007	9	http://www.fdhc.state.fl.us/dhit/Board/Br dmtg63007.pdf
Florida	<p>Study/Report Name: Florida Health Information Network Architectural Considerations for State Infrastructure Draft White Paper, Version 6.2.</p> <p>Sponsor(s): Florida Agency for Health Care Administration and the Governor’s Health Information Infrastructure Advisory Board.</p> <p>Author(s): Florida Agency for Health Care Administration and the Governor’s Health Information Infrastructure Advisory Board.</p>	Apr 19, 2007	75	http://www.fdhc.state.fl.us/dhit/Board/F WP62.pdf

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
Georgia	<p>Study Report/Name: Georgia Health Information Technology and Transparency (HITT) Strategic Plan</p> <p>Sponsor(s): Office of Health Information Technology & Transparency, Georgia Department of Community Health</p> <p>Author(s): Office of Health Information Technology & Transparency, Georgia Department of Community Health</p>	Feb 12, 2008	31	http://dch.georgia.gov/vgn/images/portal/cit_1210/46/9/108304999HITT_Strategic_Plan.pdf
Illinois	<p>Study/Report Name: Illinois Electronic Health Records Report and Plan</p> <p>Sponsor(s): Electronic Health Records Taskforce</p> <p>Author(s): Electronic Health Records Taskforce</p>	Dec 1, 2006	129	http://www.idph.state.il.us/ehrtf/Draft%20Report/EHR%20Taskforce%20Report_Plan%20Dec%202006.pdf
Indiana	<p>Study/Report Name: Goals And Recommendations For A Statewide Healthcare Information Exchange</p> <p>Sponsor(s): Indiana State Medical Informatics Commission</p> <p>Author(s): Indiana State Medical Informatics Commission</p>	Nov 2, 2006	11	http://www.in.gov/legislative/igareports/agency/reports/ISDOH32.pdf
Kansas	<p>Study Report/Name: Kansas Health Information Technology/Health Information Exchange Initiative: Final Roadmap Summary Report</p> <p>Sponsor(s): eHealth Initiative Foundation</p> <p>Autho(s)r: eHealth Initiative Foundation</p>	Apr 1, 2006	33	http://www.khpa.ks.gov/QandI/Docs/FinalRoadmap.pdf

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
Kentucky	<p>Study/Report Name: The Kentucky e-Health Action Plan; Recommendations for Developing the Kentucky eHealth network.</p> <p>Sponsor(s):The Kentucky e-Health Network Board and the Cabinet for Health and Family Services</p> <p>Author(s): e-Health Advisory Group</p>	Apr 1, 2007	48	http://ehealth.ky.gov/NR/rdonlyres/0AC2A0FA-86B9-40EC-AD7C-9873C7400D2C/0/eHealthActionPlan.pdf
Louisiana	<p>Study Report/Name: Development of Regional Health Information Organizations: Support of Gulf Coast Health Information Activities</p> <p>Sponsor: US DHHS Office of the National Coordinator for Health IT</p> <p>Author: eHealth Initiative Foundation</p>	Apr 30, 2006	87	Not available via the Internet
Maryland	<p>Study/Report Name: Final Report: Task Force to Study EHRs.</p> <p>Sponsor(s): Maryland Health Care Commission</p> <p>Author(s): Task Force to Study Electronic Health Records</p>	Dec 31, 2007	114	http://mhcc.maryland.gov/electronichealth/presentations/task_force_rpt123107.pdf
Maryland	<p>Study/Report Name: Strategies for a Person-Centric, Inclusive Maryland Health Information Exchange</p> <p>Sponsor(s): Maryland Health Care Commission</p> <p>Author(s): Montgomery County Health Information Exchange Collaborative (MCHIE)</p>	Feb 16, 2009	319	http://mhcc.maryland.gov/electronichealth/MCHIE_Final_Report.pdf
Maryland	<p>Study/Report Name: A Plan for a Citizen-Centric Statewide Health Information Exchange in Maryland</p> <p>Sponsor(s): Maryland Health Care Commission</p> <p>Author(s): Chesapeake Regional Information System for our Patients (CRISP)</p>	Feb 16, 2009	96	http://mhcc.maryland.gov/electronichealth/CRISP_FinalReport.pdf

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
	<p>Study/Report Name: The Impact of Electronic Health Information Exchange (HIE) Services in Maine: Avoidable Service and Productivity Savings Estimates Related to HealthInfoNet Services Sponsor: HealthInfoNet Author(s): Alfreds, Witter</p>			<p>Contact Dculver@hinfonet.org</p>
Maine	<p>Study/Report Name: Phase II Planning and Development Report Part I Sponsor(s): Maine Health Information Network Technology (MHINT) Author(s): Maine Health Information Center</p>	Jan 27, 2006	83	<p>http://www.hinfonet.org/meetings/MHINT_Progress_Rpt_2005.pdf</p>
Maine	<p>Study/Report Name: A Statewide Clinical Information Sharing Network Feasibility Study: Phase I Report Sponsor(s): Maine Health Information Network Technology (MHINT) Author(s): Maine Health Information Network Technology (MHINT)</p>	Dec 15, 2004	111	<p>http://www.mhic.org/Phase%20I%20Report%20Draft%20121604A.pdf</p>
Michigan	<p>Study/Report Name: Conduit to Care: Michigan's e-Health Initiative Sponsor(s): Michigan Health Information Network (MiHIN) with Support and Assistance by the Michigan Department of Community Health; the Michigan Department of Information Technology; and a grant from Author(s): Michigan Health Information Network (MiHIN)</p>	Dec 1, 2006	132	<p>http://www.michigan.gov/documents/mihin/MiHIN_Report_Compress_v2_180321_7.pdf</p>

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
Minnesota	<p>Study/Report Name: Report to the Minnesota Legislature: Roadmap and Preliminary Recommendations for Strategic Action</p> <p>Sponsor(s): Minnesota Department of Health</p> <p>Author(s): Minnesota e-Health Initiative</p>	Jan 1, 2005	55	http://health.state.mn.us/e-health/legreport0105.pdf
Missouri	<p>Study Report/Name: Missouri Healthcare Information Technology Task Force: Final Report</p> <p>Sponsor(s): Missouri Healthcare Information Technology Task Force</p> <p>Author(s): Missouri Healthcare Information Technology Task Force</p>	Sep 1, 2006	57	http://www.dhss.mo.gov/HealthInfoTaskForce/Report.pdf
New Hampshire	<p>Study Report/Name: A Strategic Plan for Health Information Technology and Exchange</p> <p>Sponsor(s): New Hampshire Citizens Health Initiative</p> <p>Author(s): New Hampshire Citizens Health Initiative</p>	Jan 1, 2009	16	http://www.unh.edu/chi/media/Reports/2009StrategicPlan_Web.pdf
New Jersey	<p>Study Report/Name: New Jersey Commission on Rationalizing Health Care Resources: Final Report, 2008. Specifically, pages 201-204.</p> <p>Sponsor(s): New Jersey Commission on Rationalizing Health Care Resources</p> <p>Author(s): New Jersey Commission on Rationalizing Health Care Resources</p>	Jan 24, 2008	319	http://www.state.nj.us/health/rhc/finalreport/index.shtml

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
Ohio	<p>Study/Report Name: A Strategic Roadmap and Policy Options for the Effective Adoption of Health Information Technology & Exchange in Ohio</p> <p>Sponsor(s): Health Policy Institute of Ohio</p> <p>Author(s): Health Policy Institute of Ohio</p>	Dec 1, 2006	20	http://www.healthpolicyohio.org/pdf/HITRoadmap.pdf
Oregon	<p>Study/Report Name: Oregon Health Fund Board — Health Information Infrastructure Advisory Committee Recommendations</p> <p>Sponsor(s): Health Information Infrastructure Advisory Committee</p> <p>Authors(s): Health Information Infrastructure Advisory Committee</p>	Nov 12, 2008	45	http://www.oregon.gov/OHPPR/HIIAC/Final_HIIAC_Report.pdf
Pennsylvania	<p>Study Report/Name: Building a Sustainable Model for Health Information Exchange in Pennsylvania</p> <p>Sponsor(s): Pennsylvania Governor's Office of Health Care Reform</p> <p>Author(s): Pennsylvania eHealth Initiative</p>	Feb 22, 2008	40	http://www.paehi.org/Documents/PAeHI%20HIE%20White%20Paper%20Executive%20Summary%202-22-2008.pdf
Pennsylvania	<p>Study Report/Name: Connecting Pennsylvanians for Better Health: Recommendations from the Pennsylvania eHealth Initiative</p> <p>Sponsor(s): Foundation for eHealth Initiative</p> <p>Author(s): Pennsylvania eHealth Initiative</p>	Apr 1, 2007		http://www.paehi.org/Documents/PAeHI%20Better%20Health%20Report%204-25-2007.pdf

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
Rhode Island	<p>Study Report/Name: Rhode Island Quality Institute's Response to RI State RFP#: 7014715 Designation of Rhode Island's Health Information Exchange</p> <p>Sponsor(s): Rhode Island Quality Institute</p> <p>Author(s): Rhode Island Quality Institute</p>	Sep 11, 2007	100+	Response has yet to be publicly released. RFP is available online at www.purchasing.ri.gov/RIVIP/StateAgencyBids/7014715.pdf
Texas	<p>Study/Report Name: Health Information Exchange in Texas: Current Status and Future Potential.</p> <p>Sponsor(s): U.S. Department of Health and Human Services</p> <p>Author(s): Foundation for e-Health Initiative</p>	Jul 31, 2006	114	http://www.hipaasolutions.org/white_papers/HIPAA%20Solutions,%20LC%20White%20Paper%20-%20eHI%20Gulf%20Coast%20Task_Texas%20Assessment_0731_06.pdf
Texas	<p>Study/Report Name: Roadmap for the Mobilization of Electronic Healthcare Information in Texas: Final Report of the Texas Health Information Technology Advisory Committee</p> <p>Sponsor(s): U.S. Department of Health and Human Services, Office of the National Coordinator for Health IT</p> <p>Author(s): e-Health Initiative Foundation</p>	Sep 29, 2006	96	www.dshs.state.tx.us/chs/shcc
Texas	<p>Study/Report Name: Texas Health Care System Integrity Partnership Final Report</p> <p>Sponsor(s): Texas Governor's Office</p> <p>Author(s): Texas Health Care System Integrity Partnership</p>	Mar 1, 2007	36	http://www.governor.state.tx.us/divisions/bpp/thcpc/files/THCSIP-report.pdf

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
Virginia	<p>Study Report/Name: Interim Report Governor's Health Information Technology Council</p> <p>Sponsor(s): Governor's Health Information Technology Council</p> <p>Author(s): Governor's Health Information Technology Council</p>	Apr 17, 2007	26	http://www.ehealth.vi.virginia.gov/pdf/HITC_Interim_Report.pdf
Vermont	<p>Study/Report Name: Vermont Health Information Technology Plan: Strategies for Developing a Health Information Exchange Network</p> <p>Sponsor(s): Vermont Information Technology Leaders, Inc</p> <p>Author(s): Board of Directors, Vermont Information Technology Leaders, Inc</p>	Jul 1, 2007	143	http://www.vitl.net/uploads/1184614970.pdf
Vermont	<p>Study/Report Name: Vermont 2007 Blueprint for Health: Strategic Plan</p> <p>Sponsor(s): Vermont Department of Health Agency of Human Services</p> <p>Author(s): Vermont Department of Health Agency of Human Services</p>	Jul 1, 2007	68	http://healthvermont.gov/admin/legislature/documents/Blueprint_leg_report.pdf
Washington	<p>Study/Report Name: Washington State Health Information Infrastructure: Final Report and Roadmap for State Action</p> <p>Sponsor(s): Washington State Health Care Authority in collaboration with the Health Information Infrastructure Advisory Board</p> <p>Author(s): Washington State Health Care Authority in collaboration with the Health Information Infrastructure Advisory Board</p>	Dec 1, 2006	57	http://www.hca.wa.gov/hit/documents/final_wa_hca_hii_report.pdf

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State	Name, Sponsor, Author	Date Released	# of Pages	URL
Wisconsin	<p>Study/Report Name: Wisconsin Health Information Exchange (WHIE); Business Plan Summary</p> <p>Sponsor(s): Wisconsin Health Information Exchange (WHIE)</p> <p>Author(s): Seth Foldy; Edward Barthell; Sushil Pillai</p>	Dec 1, 2005	37	http://ehr.medigent.com/assets/collaborate/2006/07/12/eHI%20HRSA%20Funded%20Communities%20WHIE%20Bus%20Plan.pdf
Wisconsin	<p>Study/Report Name: Wisconsin eHealth Action Plan</p> <p>Sponsor(s): eHealth Care Quality and Patient Safety Board</p> <p>Author(s): eHealth Care Quality and Patient Safety Board</p>	Dec 1, 2006	104	http://ehealthboard.dhfs.wisconsin.gov/actionplan2006-12.pdf
West Virginia	<p>Study/Report Name: West Virginia Health Information Network Health Information Exchange Request for Information</p> <p>Sponsor(s): West Virginia Health Information Network</p> <p>Author(s): Christopher R. Clark and Jack L. Shaffer, Jr.</p>	Aug 11, 2008	15	http://www.wvhin.org/
Wyoming	<p>Study/Report Name: Final Report To The Wyoming Healthcare Commission</p> <p>Sponsor(s): Information Technology Technical Management Subcommittee On Developing A Wyoming Electronic Health Records Network</p> <p>Author(s): John Snow, Inc.</p>	November 16, 2007	135	http://www.wyominghealthcarecommission.org/images/reports/11-16-07EHR_study.pdf