



Strategic and Operational Plan for Exchange of Health Information in the State of New Hampshire

Version 8

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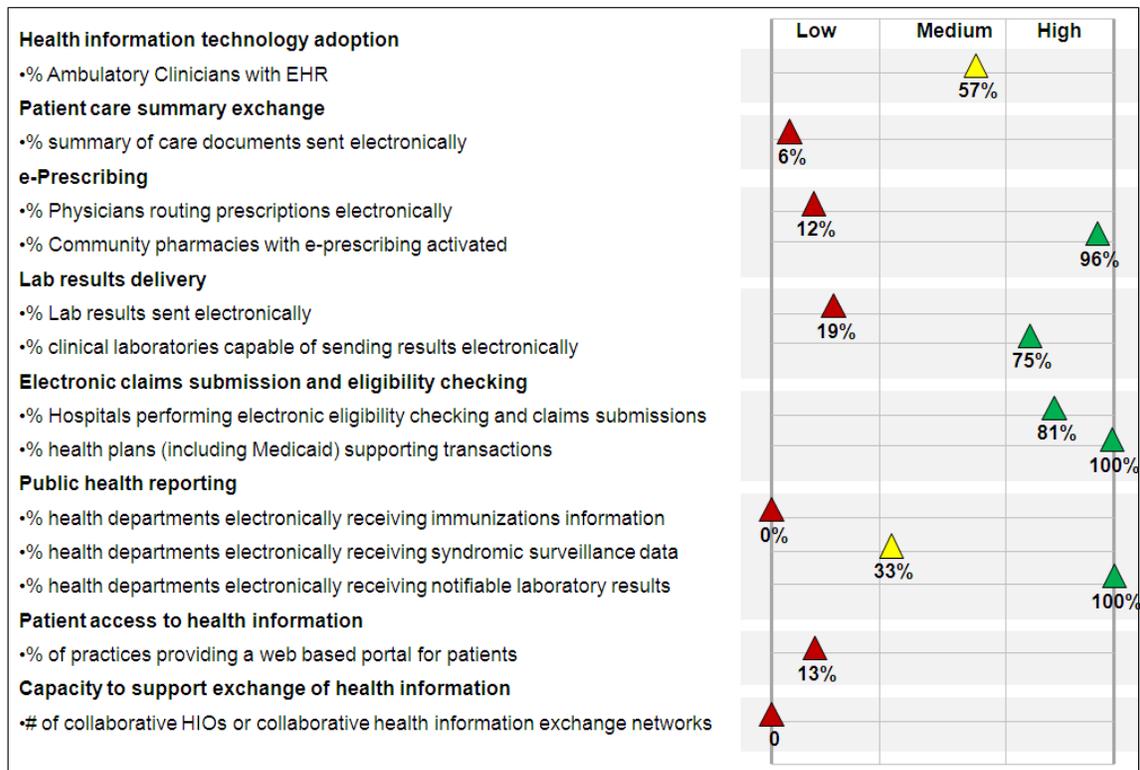
Executive Summary

The current state of HIT and HIE in New Hampshire

The State of New Hampshire boasts one of the more advanced health information exchange (HIE) infrastructures in the country. This high degree of electronic sophistication – reflected, for example, in high penetration of electronic health records (EHRs) and electronic lab results delivery – has been driven by three key factors. First, almost two-thirds of physicians are employed by or closely affiliated with hospitals and hospital systems. Second, these hospital systems have made significant investments in EHRs and health information exchange capabilities among their respective employed and affiliated groups. Third, many of the State’s Federally Qualified Health Centers (FQHCs) and rural clinics have worked together to develop sophisticated health information technology (HIT) capabilities. Together, these three factors have driven a high degree of capability for HIE within each of these networks, which collectively cover much of the state today.

Yet, as significant as this progress has been, there is high variation in the breadth and depth of health information exchange within these networks, and as such, gaps remain. The following “scorecard” provides a high level summary of the state of health information exchange in New Hampshire.

Figure 1: Scorecard of the state of health information exchange in New Hampshire



A deep scan of New Hampshire’s HIT and HIE environment reveals 17 gaps to be addressed through the Health Information Exchange Planning and Implementation (HIEPI) project and in collaboration with private and other public initiatives underway in the state. Table 1 provides a summary of these gaps and the recommendations that inform New Hampshire’s strategy moving forward.

Table 1: Summary of gaps and recommendations identified in environmental scan

#	Current Gap	Recommendation
Health information technology adoption		
1	A substantial fraction (43%) of ambulatory providers do not have EHRs	Help coordinate the efforts of programs focused on HIT adoption within the State (e.g., Regional Extension Center program, Medicaid planning, private health plan incentive programs)
2	A substantial fraction (34%) of ambulatory clinicians are not part of existing hospital HIE activities and planning	Devise policy and/or technology approaches to facilitate creation of new networks or expansion of existing networks to include independent ambulatory practices and other ambulatory entities
Patient care summary exchange		
3	There is considerable summary care exchange activity within hospital networks in the state today, but relatively little of it is MU-compliant and the majority is focused on unidirectional information from the hospital to ambulatory providers	Support exchange of electronic patient health information for purposes of care coordination among organizations and healthcare stakeholders
4	There is almost no MU-compliant summary care exchange capability among ambulatory providers, from ambulatory settings back to hospitals, or across hospital networks	Give high priority to developing solutions for MU-compliant summary care exchange in these gap areas. Develop an approach to address summary care exchange needs of independent practices outside of hospital networks, and exchange capacity across hospital networks.
5	There is a high degree of heterogeneity across hospital networks in the level and types of HIE activities being supported, as well as in their readiness for MU.	Conduct detailed assessment of MU-readiness of each network, and develop program to facilitate achievement of HIE core capability across all hospital networks
ePrescribing		
6	88% of Providers are not e-Prescribing and 4% of community pharmacies are not set up for e-prescribing	Encourage eRX adoption through outreach and education in coordination with MU incentives and prospective REC. No need to create infrastructure, adequate e-prescribing capabilities are commercially available
7	Patient coverage for benefit/history information is relatively low (66%)	Identify drivers of low patient coverage and develop program to expand coverage.
Lab results delivery		
8	25% of clinical laboratories do not have capability to send outpatient lab results via an EHR interface	Encourage development of lab EHR interfacing capabilities through outreach, education, and policy guidance
9	Over 80% of lab hospital labs do not use EHR interfaces as the primary means of lab results delivery to ambulatory practices.	Encourage labs to shift delivery of results to EHR interface channel through outreach, education, and policy guidance

Electronic claims submission and eligibility-checking		
10	Although the dominant payers are capable of supporting electronic claims submission and eligibility checking, a portion of providers (~20% of hospital system owned/affiliated providers) are not using this capability.	Encourage adoption through outreach and education in coordination with MU incentives and prospective REC – No need to create infrastructure, adequate capabilities are commercially available
Public health reporting		
11	Current state law prohibits an HIE entity from conducting public health information exchange with PHI	Support expansion of current law to allow an HIE entity to conduct public health transactions that are required by law and/or by meaningful use
12	No electronic immunization information is delivered from providers or hospitals to public health	*Support secure and private exchange of electronic immunization information to public health departments – this would allow the state to meet its immunization registry obligations under RSA 141-C:20
13	No electronic notifiable lab results are delivered from community labs to public health	*Support secure and private exchange of electronic notifiable lab results to public health departments
14	Limited electronic information flows to the city public health departments	*Support secure and private exchange of electronic immunization information, notifiable lab results, and syndromic surveillance information to city public health departments as appropriate
15	<p>Current public health reporting systems are burdensome, inefficient, and rely upon transmission channels that are difficult to secure:</p> <ul style="list-style-type: none"> ▪ Hospitals, providers, and labs are required to report several types of information to public health through multiple disparate systems ▪ Data submission is often conducted through mail, fax, phone, and email transmission channels – public health has had to compensate for the security level of these channels by instituting policies and procedures to ensure the privacy and security of personal health information ▪ The State uses manual data entry processes for majority of information capture and reporting ▪ Multiple systems are required by law to use identified personal health information 	*Improve privacy, security, and efficiency, governance, and technical integrity of mandatory public health reporting – consider system consolidation and sunset transmission options that are less secure than new channels
Patient access to health information		
16	The majority of practices do not provide patients with electronic access to their health information.	*Support secure and private exchange of health information with patients
Capacity to support collaborative statewide HIT/HIE activities		

17	No “collaborative HIE networks” or organizations operating in NH	Build an organizational and technical foundation for achievement of longer term statewide health information goals
*Note: Not allowed to be conducted through an HIE entity according to current NH law.		

Vision for Health Information Technology and Exchange in New Hampshire

The vision for health information technology and exchange in New Hampshire that forms the basis of this strategic and operational plan draws from two cornerstone statewide efforts.

On December 12, 2009 the New Hampshire Hospital Association facilitated a multi-stakeholder consensus process and adopted the following HIT and HIE Vision:

The vision is for a national system of exchangeable health information to improve health patient care, develop health policy, improve public health, and to base hospital and physician payment for services on value and quality. A national system is an important long term goal but it should not slow down the current deployment of local HIE.

Two years prior, on September 6, 2007, the NH Citizens Health Initiative ratified a vision for New Hampshire Health Care Information Technology and Exchange in 2014. This vision was developed through a multi-stakeholder collaborative process which achieved consensus on the principals for HIT and HIE in New Hampshire.

For Health Information Technology (HIT) and Health Information Exchange (HIE) to be successful in New Hampshire, there is a need to recognize the interrelationships and importance of patient privacy, patient safety, and public health. The NH Citizens Health Initiative holds the following vision for health care information technology and exchange for 2014:

Private and Secure. A patient’s personal health information will be secure, private, and accessed only with patient consent or as otherwise authorized or required by law.

Promotes Quality, Safety, and Efficiency. HIT and HIE will serve as vehicles to promote quality and patient safety, increase efficiencies in health care delivery, and improve public health;

Electronic. All health care providers will use a secure, electronic record for their patients’ personal health information;

Accessible. All patients will have access to a secure, electronic, and portable health record;

Equitable. HIT will be a vehicle to support equitable access to health care services.

The strategic and operational plan reflects the core principles of these complementary vision statements. We emphasize that these principles form a vision for what should be accomplished by HIT and HIE together in the state of New Hampshire. While some functions may be deemed most appropriate for HIT, (for example through capabilities delivered through electronic health records or other client-level technologies), and others for HIE, the goal is to achieve the vision through the complementary combination of HIT and HIE capabilities.

Strategies for Achieving Health Information Exchange Vision

The following strategies define what we propose to do to meet our goals and achieve our vision:

1. Establish a sustainable organizational, governance, and technical foundation for achievement of long term statewide health information goals
2. Level-set individual providers' abilities to meet stage 1 meaningful use criteria by facilitating ePrescribing, lab results delivery, and patient care summary exchange across the state
3. Catalyze the efforts of programs focused on HIT adoption
4. Expand availability of HIE services to providers that do not currently have access to robust capabilities for health information exchange
5. Collaborate with Legislators to define the future policy governing HIE purpose and participants

Strategy 1 – Establish a sustainable organizational, governance, and technical foundation for achievement of long term statewide health information goals

As identified in the environmental scan, there is currently no organization, governance, or technical foundation in place to facilitate inter-organizational health information exchange. In response, our strategy is to design and launch a self-sustaining Health Information Organization (HIO) and corresponding governance body to help facilitate achievement of long term statewide health information goals. We will also create a technical foundation for secure messaging that can provide value on its own and that is extensible for broader and deeper future functions.

Strategy 2 - Level-set individual providers' abilities to meet stage 1 meaningful use criteria by facilitating ePrescribing, lab results delivery, and patient care summary exchange across the state

As identified in the environmental scan, there are gaps in e-prescribing, lab results delivery, and care summary exchange. In response, our strategy is to facilitate exchange of key health information. This strategy will be accomplished through education, outreach, and coordination activities where viable technology options are in place, either within "HIE clusters" or in the private marketplace. Where there are no technology options in place, we will work to bridge existing HIE clusters by deploying a Health Information Exchange.

Strategy 3 – Catalyze the efforts of programs focused on HIT adoption

Health information exchange is reliant upon providers adopting and properly using electronic health records. To address this challenge we will help coordinate the efforts of programs focused on HIT adoption within the State including Medicaid and the prospective Regional Extension Center among others.

Strategy 4 – Expand availability of HIE services to providers that do not currently have access to robust capabilities for health information exchange

Roughly 34% of the State's providers are not affiliated with the hospital systems and are in need of a means to access robust capabilities for health information exchange. We will assist these providers to join an existing, or form a new, HIE cluster in order to access adequate health information capabilities.

Strategy 5 – Collaborate with Legislators and Stakeholders to define the future policy governing HIE purpose and participants, and the value propositions to ensure ongoing private sector participation

Current law places restrictions on the types of transactions that can be conducted by a collaborative HIE entity. Transactions through an HIE entity are only allowed for information sharing among providers for

treatment purposes. This law currently prohibits many information transactions that have been identified by stakeholder representatives as having high value. Stakeholder representatives have reached consensus on the desire to work with Legislators to continue to define the future policy that governs health information exchange. In particular, stakeholder representatives would like to explore use of the HIO and its technical infrastructure for the following purposes:

- Public Health Reporting - Public health reporting is statutorily required, however, the current law does not allow such transactions to be brokered by an HIE entity in New Hampshire. There is an opportunity to streamline the public health reporting burden placed upon providers by the current public health reporting systems (35 separate systems in use) by utilizing statewide HIE services for public health transactions. This provides an opportunity to reduce the non-secure, non-private transmission channels currently in use for public health reporting (e.g., Mail, fax, phone) while introducing multi-stakeholder governance and oversight for personal health information used for public health purposes. Finally, this will help reduce the multiple ad hoc point-to-point electronic and non-electronic solutions in place between providers and public health and encourage capacity building of public health systems to accept electronic reporting of immunizations, notifiable diseases and syndromic surveillance information from providers.
- Meaningful Use Reporting to Medicaid & Medicare/ Quality Reporting – Beginning in 2012, providers and hospitals will be required to report meaningful use indicators to the Centers of Medicare and Medicaid Services (CMS) to qualify for and receive incentive payments. Current law prohibits sharing of information with CMS via the statewide HIE service. There is an opportunity to efficiently provide a shared service to providers via the HIE for meaningful use reporting. Many hospitals and providers participate in quality improvement initiatives with private payers including variations on “Pay for Performance” and Pay for Outcomes” incentive programs. There is an additional opportunity to efficiently provide a shared service for quality reporting via the HIO.
- Patient engagement – Although patients own their own health information, current law prohibits patient participation in the HIE entity to access such information electronically. This means patients must request copies of records from multiple sources and in multiple formats (e.g., electronic, paper) placing a significant administrative burden on patients and providers upon each request. There is an opportunity to facilitate private and secure hospital-to-patient, provider-to-patient, and lab-to-patient information transactions. The use of an HIO to facilitate such information sharing opens opportunities for patients to use personal health records and associated self-management tools which provide critical information feedback for patient engagement in wellness and healthcare decisions. (Note: we have not reached consensus on whether patients should be direct customers of the HIO or if they will be better served by a primary care provider that is supported by the HIO. This will be determined in future planning efforts.)

The immediate priority will be to pursue expansion of the current law to allow public health reporting that is already required by statute and regulation, and quality reporting that will be required by CMS.

Launch of a collaborative Health Information Organization

New Hampshire proposes to work with the General Court (i.e., the New Hampshire state legislature) to design and launch a self-sustaining Health Information Organization (HIO) and corresponding governance body to facilitate achievement of long term statewide health information goals. Our current recommendation is to have the HIO take the form of a “public instrumentality” which is a public/private organization that is loosely attached to State government. Though this will require the approval of the General Court, we believe that this added complexity is more than compensated for by the following benefits:

- Oversight of public funds: With a public instrumentality, State government oversight will be in place and the State can work closely with a multi-stakeholder board of directors to provide proper oversight. This level of oversight will help ensure legal, private, and secure exchange of personal health information. Statute may dictate the structure and processes for oversight as well as the level of transparency and accountability required.
- Ability to access both public and private funds: A public instrumentality will have mechanisms in place for allocating Federal and State public funds. In addition, the organization can seek 501(c)(3) not-for-profit status and sustain itself using multiple sources of tax exempt revenue, given that it meets IRS not-for-profit requirements.
- Responsiveness to public and private needs: Although a public instrumentality will have some attachment to the State to be defined by the General Court (e.g., administration of State funds, oversight) the organization can act as an independent entity. This form of organization will allow private stakeholders to participate in governance and management of the organization, which will be key to building an organization that is responsive to public and private needs and that can build a sustainable business model through attraction of private funds. The organization also will be required to operate more like a business than a government agency and will need to be designed in a way that allows the organization to be operationally “nimble.”

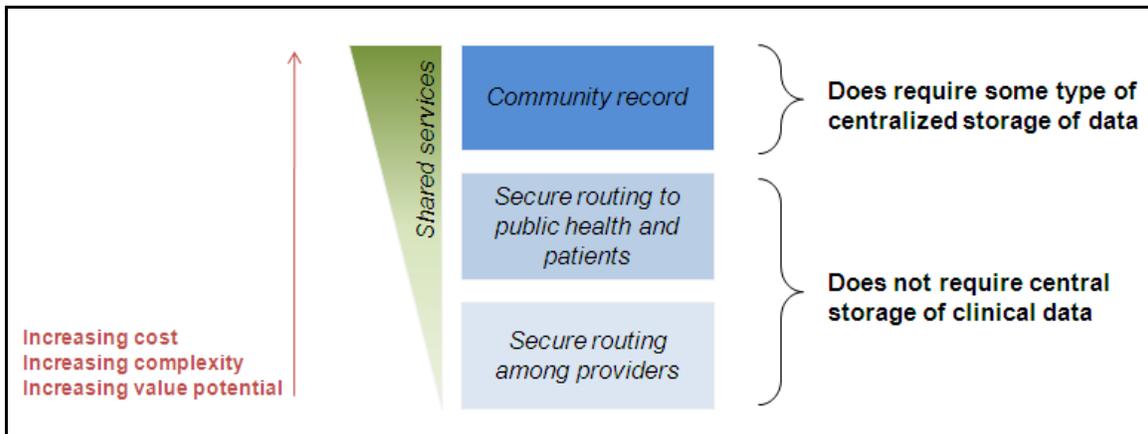
As noted, creation of a public instrumentality requires legislation and our strategy will be to file this legislation as early as possible in the 2011 legislative session, most likely before the end of calendar year 2010.

Creation of a technology foundation for health information exchange

Given the capabilities in place in New Hampshire, the remaining gaps, and the legal, financial, organizational, and program constraints that are present, we are pursuing a “building block” approach to facilitating statewide health information exchange services. As depicted in the diagram below, we have created a “building block” HIE framework that defines incremental steps to building a comprehensive, ubiquitous statewide HIE service, and within that overall framework, a core foundation to achieve FOA and PIN requirements and fill the immediate gaps in statewide HIE capacity. This SOP recommends using the Cooperative Agreement funds to establish this core foundation.

Given future demand from stakeholders to provide additional capabilities, given proposed changes in New Hampshire Law to allow the HIE entity to serve stakeholders that are not healthcare providers, and given future sources of additional revenue, the state’s stakeholders may consider the implementation of higher value and higher complexity building blocks over time. This allows us to begin with a foundation with the lowest possible cost and complexity, to generate immediate value for stakeholders, and to move up to higher level building blocks if viable as determined through a multi-stakeholder decision making process.

Figure 2: HIE Building Blocks



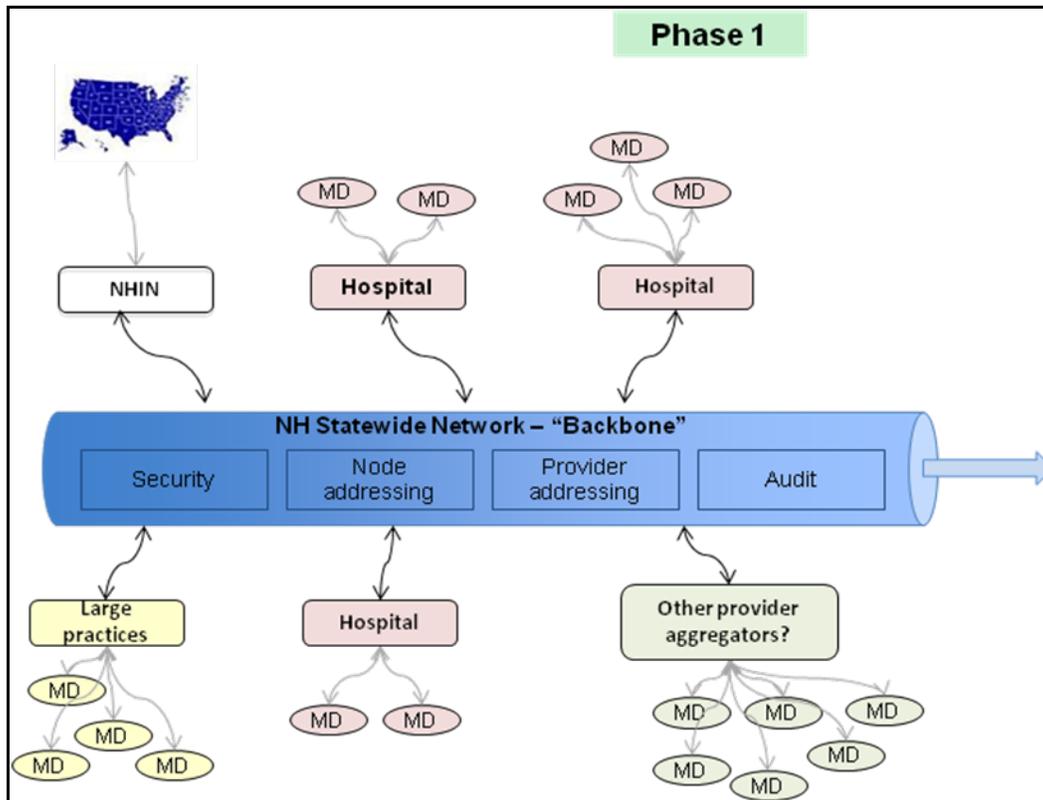
The purpose of this building block approach is to identify the full spectrum of functions and associated technologies that *could be* implemented through a statewide HIE. Our prioritization and phasing process, described below, describes what *will be* implemented in the first phase of activities. We used this framework to allow more robust decision-making through consideration of the value-complexity trade-offs associated with deeper levels of system integration, and to ensure that investments made today would allow future growth into higher levels should there be consensus to build further in the future.

We intend to begin the implementation process for the “secure routing among providers” building block beginning in the fall of 2010. This will provide a capability that will enable secure “directed exchange” or “push” of information from one provider to the next for treatment purposes. This building block will allow no delivery to non-provider entities (e.g., public health, patients, quality warehouse), no clinical data held or accessed by the HIO, and unidirectional (i.e., one-way) delivery of secure messages only to trusted and technologically secured systems.

Secure routing offers healthcare providers a much more secure and private, timely, and efficient way to execute necessary information sharing transactions than is currently available through the fax, mail, and telephone channels that are commonly used today. This foundation will help hospitals and providers meet stage 1 meaningful use criteria so they may qualify for incentives from CMS and State Medicaid. Since a standards-based secure routing platform will make it easier and cheaper to send care summaries, patient referrals, lab results, and other information for those organizations that haven’t already invested in their own technologies, it is also likely that information sharing will occur where it does not occur today, creating value through increased coordination of care. Since the secure routing technical infrastructure will enable transfer of standardized structured data, many of New Hampshire’s organizations will be able to take in patient information from other organizations without having to perform many manual processes that are in place today, such as data entry and document scanning. This can create value for all stakeholders through reduction in transcription error rates, administration time spent on data entry, and administrative costs.

Figure 3 provides an illustration of the initial HIE architecture.

Figure 3: Phase 1 HIE Architecture



Phase 1 architecture includes a lean technical backbone for secure routing of clinical documents and information from provider to provider and incorporates the following capabilities:

- Secure routing across HIE clusters
- Secure routing within HIE clusters where not currently available
- Secure routing with entities outside of hospital HIE clusters
- Secure routing with the Nationwide Health Information Network (NHIN) which allows connectivity to the VA, DoD, and other states
- Authentication & secure transport
- Provider entity registry
- Provider directory
- Message format translation & validation
- Message routing
- Delivery acknowledgement
- Audit/logging
- Delivery adaptors

The phase 1 secure routing infrastructure will facilitate many types of information exchange among healthcare providers. Table 2 lists the specific use cases that will be enabled by this building block.

Table 2: Phase 1 Use Cases

ID #	What	From whom	To whom	Phasing	Main reason for Phase categorization
1	Hospital discharge summary	Hospital	Hospital	1	MU and NHHA-consensus priority
2	Key clinical information summary	Hospital	Hospital	1	MU priority
3	Request for key clinical information	Hospital	Hospital	1	Multiple hospital request
5	Imaging reports	Hospital	PCP or specialist	1	Available only in larger hospital systems today
6	Lab results	Hospital	PCP or specialist	1	
7	Request for key clinical information	Hospital	PCP or specialist	1	
9	Hospital admission notification	Hospital	Referring Hospital	1	Continuity of care priority
10	Hospital admission notification	Hospital	Referring physician and/or PCP	1	
11	Hospital discharge summary	Hospital	Referring physician and/or PCP	1	MU and NHHA-consensus priority
12	Hospital ED visit summary	Hospital	Referring physician and/or PCP	1	MU priority
16	Referral -- Summary of care record	PCP	Specialist	1	MU and NHHA-consensus priority
17	Key clinical information summary	PCP or specialist	Hospital	1	MU priority
18	Referral -- Summary of care record	PCP or specialist	Hospital	1	MU and NHHA-consensus priority
27	Consult note -- Summary of care record	Specialist	PCP	1	MU and NHHA-consensus priority

Anticipated implementation costs for phase 1

The estimated cost for the design and launch of the phase 1 secure routing technical infrastructure and for the design, launch, and operations of a new HIO totals \$8.9 M for federal fiscal years 2010 – 2014.

The Cooperative Agreement provides approximately \$5.5M in federal funds which, even with the addition of matching funds, falls short of our current budget estimate. We will work aggressively to reduce costs through in-kind contributions from stakeholders and shared service approaches with hospital systems and with other states (for example, regional approaches to provider directories). We also anticipate that the more focused business engagement process that we will undertake over the remainder of the calendar year for the creation of the business plan will identify revenue opportunities from provider organizations seeking lower-cost solutions for achieving Stage 1 and future meaningful use requirements.

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This Strategic and Operational Plan for Exchange of Health Information in the State of New Hampshire is the product of a multi-stakeholder collaborative process representing the consensus thinking at this time. Health information exchange is a dynamic and evolving area that, going forward, will be subject to change dependant on a number of factors including, but not limited to, federal and state laws, regulations and policy guidance as well as ongoing stakeholder involvement, technology advances, and market conditions. Implementation of a collaborative health information exchange activity will be achieved by a self-sustaining Health Information Organization and corresponding governance body. Accordingly, New Hampshire expects to amend and modify any and all sections of this plan to accurately reflect current planning and implementation of statewide collaborative health information exchange activities.

Strategic Plan

Introduction

On February 8, 2010, the New Hampshire Department of Health and Human Services (DHHS) received a \$5.5 million federal grant for the New Hampshire Health Information Exchange Planning and Implementation Project (HIEPI). The grant program, which was established by the American Recovery and Reinvestment Act of 2009 (ARRA) and is administered as a cooperative agreement by the federal Office of the National Coordinator for Health Information Technology (ONC), is part of a broader federal effort to expand the use of health information technology nationwide. That federal effort will invest approximately \$20-30 billion over the next decade in incentives to clinicians and hospitals for adoption of electronic health records (EHRs), and grants to States for adoption of policies and approaches to promote secure health information exchange among clinicians, hospitals, health plans, and public health agencies.

The purpose of the New Hampshire grant is to establish a foundational capability for improving the quality, safety, efficiency and affordability of health care through greater use of secure health information exchange across the State. Health information exchange is a broad term that describes policies, processes, and technologies that allow health care organizations to use the internet to securely and efficiently relay selected medical information in order to enhance medical care and streamline associated administrative overhead, such as billing, claims processing, and required reporting.

Some of the benefits that New Hampshire residents could realize include improvements in:

- Quality of care through better coordination of key medical information for patients who see multiple providers across care settings
- Safety of care through reduction of preventable errors, such as adverse drug reactions that occur when physicians or hospitals are not fully aware of which drugs a patient may be allergic to or may be already taking, or repeated exposure to radiation when physicians or hospitals are not fully aware of which imaging tests a patient may have already had
- Security and Efficiency of medical record handling through reduction in the use of paper-based records and fax-based exchange of records which are both costly and difficult to securely store and manage

The program also holds promise for more immediate benefits to New Hampshire's clinicians and hospitals by making it easier for them to qualify for federal "meaningful use" (MU) incentives, which provide sizable financial payments to hospitals and physician practices that use health information technology (HIT) for specific clinical activities that are known to improve care. The aggregate incentive payments to NH hospitals and physicians are estimated to total over \$100 million over the next 5 years and as such represent a considerable economic development and healthcare improvement opportunity for the state. In order to qualify for these incentives, however, providers must meet certain requirements for high priority clinical activities include prescribing, laboratory order/result management, and transmission of necessary medical summary from one care setting to the next (such as between a primary care physician and a specialist, or from a hospital to a nursing home). In order to receive these federal MU incentives, medical providers need to conduct such transactions according to federal technical and security standards. The HIEPI project will allow us to identify where there might be gaps in the ability of providers to meet federal requirements today and use federal program funds to identify the best ways to coordinate public and private efforts to fill such gaps to accelerate the flow of MU incentive funds into the State and lower the cost to providers of qualifying for such incentives.

Creating a durable statewide HIE approach is a highly complex undertaking. At a minimum, it needs to benefit patients and providers, meet state and federal laws and regulations, complement private-sector

goals, catalyze future public- and private-sector investment, and promote and enforce high security and privacy-protection. Such complexity can only be managed through extensive public-private collaboration and broad, multi-stakeholder input and ongoing participation. In May 2010, DHHS engaged strategic planning and health information exchange experts from the Massachusetts eHealth Collaborative (MAeHC) to facilitate a multi-stakeholder strategic and operational planning (SOP) process. In early June of 2010, over 100 stakeholders representing 40 stakeholder groups were brought together to kick off the Health Information Exchange Planning and Implementation project. The goal of the effort is to create an SOP that would fulfill the immediate federal grant requirement but would also lay the foundation for a longer-term public-private collaboration to facilitate broad, enduring, and secure HIE capability across the state.

A project structure was created for completion of an SOP by the end of summer 2010. Multi-stakeholder workgroups were formed to address five HIE planning and operational domains; Governance, Finance, Technical Infrastructure, Business & Technical Operations, and Legal & Policy. A sixth and seventh ad-hoc workgroup were later added to specifically address public health and stakeholder communication.

Each of the 5 original workgroups met six times throughout the summer to identify key HIE issues and opportunities, and to gain consensus on a recommended strategy for the State. Stakeholder representatives were asked to share information from workgroup sessions with stakeholders not directly involved in the planning effort, to bring additional input and ideas from outside conversations to the planning effort, and to a highly collaborative representative democracy to set strategic direction for the State.

In support of the collaborative planning effort, the University of New Hampshire's New Hampshire Institute for Health Policy and Practice, and MAeHC worked closely with leaders across the State to assess the healthcare landscape and the state of health information exchange in New Hampshire.

The following Strategic and Operational Plan presents the results of this intensive collaborative planning effort which occurred under very tight deadlines and a requirement for plan submission to ONC by the end of August 2010. We begin with an environmental scan and a gap analysis to identify the current state of health information exchange in the State. The plan then lays out a framework for identifying possible HIE approaches for filling such gaps and analyzing these options according to multiple criteria, such as stakeholder demand, technical complexity, affordability, legality, and organizational complexity. The framework allows us to outline an incremental approach to building a comprehensive HIE service that could be phased in over time. Finally, the plan details what the State of New Hampshire proposes to do in the first phase of the approach, which constitutes a set of HIE functions that meet ONC program requirements for supporting phase 1 meaningful use, have a broad consensus of support among the state's stakeholders, and that are achievable within the constraints of the current budget, policy, and organizational environment.

Even more important than the organization and infrastructure plan, the SOP institutionalizes a collaborative governance approach for managing the Phase 1 project and deciding on future collaborative projects and approaches for achieving common statewide goals.

Note to readers regarding terminology

This plan introduces many new terms and acronyms which are defined in a glossary in Appendix B. We would like to draw your attention to a few terms up front that can be a source of confusion. We are following the emerging national convention for these terms.

Health information exchange (HIE) <verb>: In this plan, “health information exchange” refers to the act of sharing personal information among two or more parties (e.g., a hospital sending a discharge summary to a primary care provider). New Hampshire statute also refers specifically to a health information exchange in its noun form. This will be called an “HIE entity” in this plan and will be discussed in detail within the policy sections of the plan.

Health information organization (HIO) <noun>: In this plan, “HIO” refers to an organization and governance structure and the technical infrastructure that is responsible for facilitating private and secure exchange of health information among stakeholders from multiple organizations. The State does not currently have an HIO so the New Hampshire Department of Health and Human Services is taking the HIO role in the interim. The General Court may consider legislation in 2011 to a new public/private organization to take the HIO role over the long term.

HIE Cluster: In this plan, the term “HIE cluster” is used to describe an organization or group of organizations that have an advanced capability for exchanging health information. In New Hampshire, these HIE clusters are primarily large hospital systems, large practice organizations, and organizations that have aggregated multiple health centers or ambulatory practices for purposes of information exchange. “HIE cluster” synonyms include: Node, Hub, and Aggregator.

SP-1 Environmental Scan

Introduction

The State of New Hampshire boasts one of the more advanced health information exchange (HIE) infrastructures in the country. This high degree of electronic sophistication – reflected, for example, in high penetration of electronic health records (EHRs) and electronic lab results delivery – has been driven by three key factors. First, almost two-thirds of physicians are employed by or closely affiliated with hospitals and hospital systems. Second, these hospital systems have made significant investments in EHRs and health information exchange capabilities among their respective employed and affiliated groups. Third, many of the State’s Federally Qualified Health Centers (FQHCs) and rural clinics have worked together to develop sophisticated health information technology (HIT) capabilities. Together, these three factors have driven a high degree of capability for HIE within each of these networks, which collectively cover much of the state.

Yet, as significant as this progress has been, there is high variation in the breadth and depth of health information exchange within these networks, and as such, gaps remain. These gaps can be analyzed in terms of *types of exchange entities* and in terms of *types of exchange transactions*.

In terms of types of exchange entities, gaps exist primarily in four key areas:

- Within hospital networks - Employed and affiliated physicians within hospital service areas who do not yet receive meaningful use (MU) level transactions through their hospital network
- Outside of hospital networks - Ambulatory physicians outside of existing hospital networks for whom no plan exists today for health information exchange
- Across hospital networks - Hospital-to-hospital exchange, which is mostly non-existent except for a very small number of bilateral exchanges between hospitals
- Across state boundaries - Cross-state health exchange for all hospitals and physicians, for which no electronic exchange capabilities exist today.

In terms of types of transactions, the main gap areas include:

- ePrescribing - Prescribing adoption on the clinician side has lagged behind very high eRX capability on the pharmacy side
- Laboratory results - The vast majority of labs are conducted by hospitals, and while the large hospitals have very high electronic results delivery penetration within their own networks, there are no cross-network electronic capabilities at present. In addition, smaller hospitals are not quite as far along, and the public health laboratories operated by the state rely on paper results delivery at present.
- Summary of care exchange - There is little exchange of summary of care documentation between organizations and only a small portion of these transactions occur through electronic interfaces. There is almost no document exchange of information with patients. There is some document exchange between the hospitals and long term care, community health centers, and home health organizations, but this currently transpires through portal, fax, and paper channels.
- Public health reporting - There is robust electronic syndromic surveillance reporting in place through the Automated Hospital Emergency Department Data (AHEDD) system. There are large gaps for electronic exchange of immunizations and notifiable condition information.
- Claims & eligibility checking - Electronic claims submission and eligibility checking transactions by providers, though fairly robust, still have room for improvement given that all the major commercial health plans and NH Medicaid are capable of facilitating these transactions

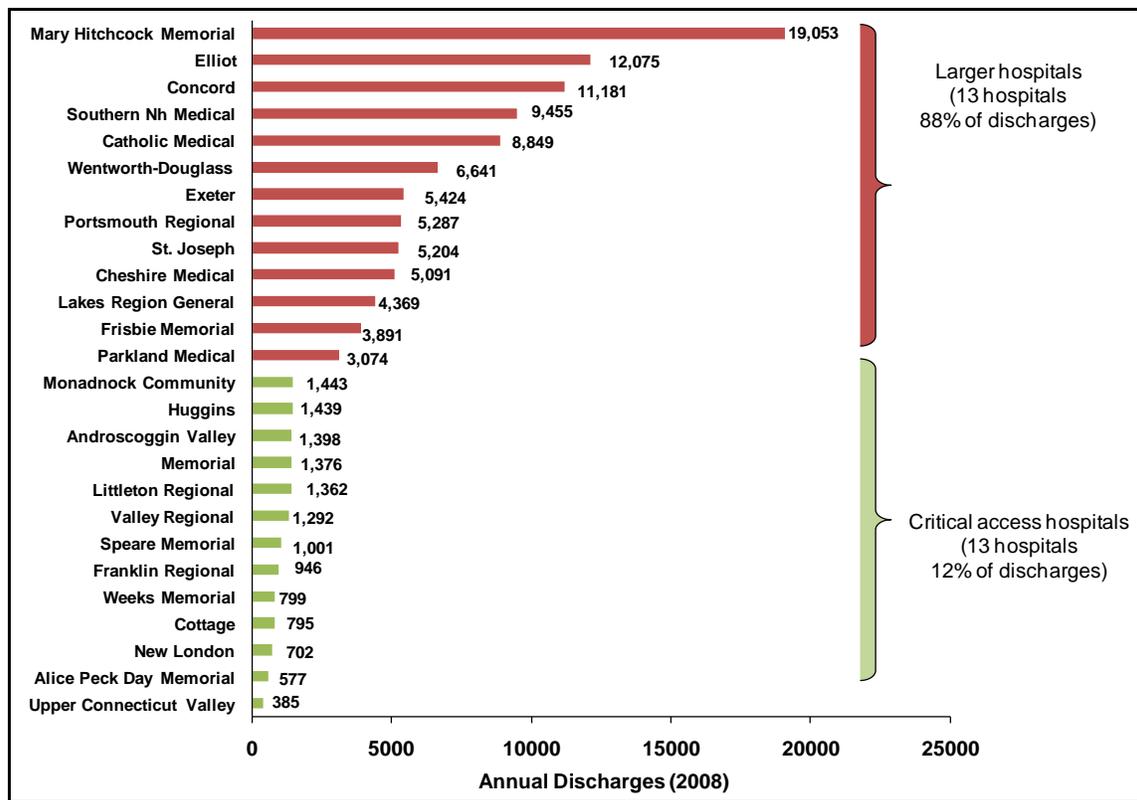
- Patient access to information – The majority of patients do not have electronic access to their health information

This environmental scan is an analysis at a point-in-time (summer 2010) in a landscape that is going through tremendous growth including continued EHR adoption and activity to help hospitals and healthcare providers meet meaningful use requirements. The following sections outline the current state of the State regarding HIT and HIE capabilities and provides a foundation of fact upon which we have determined our future strategy.

The state of HIT adoption in New Hampshire

There are 26 acute care hospitals in the state, 50% of which are designated critical access hospitals (CAHs). These CAHs, though composing only 12% of discharges in the state in 2008, are a critical part of the health care backbone of this largely rural state.

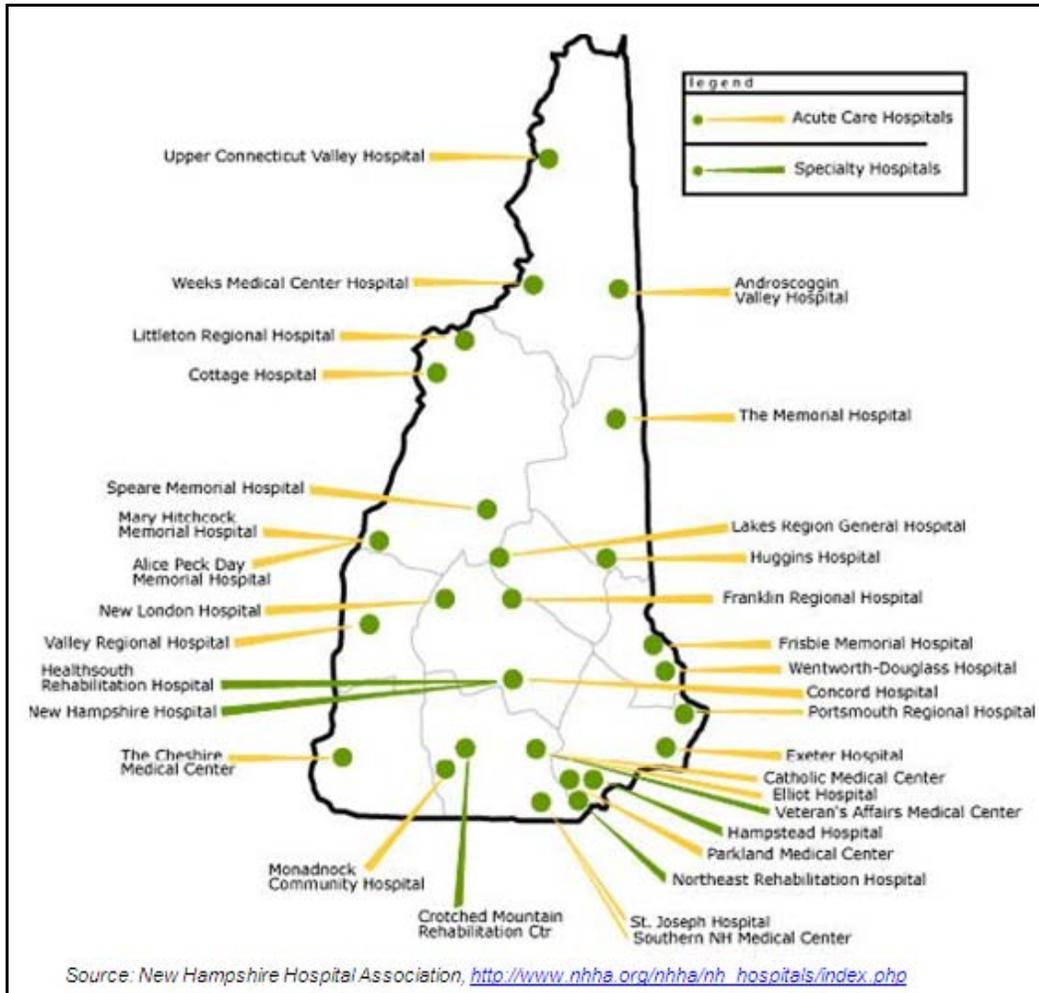
Figure 4: New Hampshire Hospitals in Order of Annual Inpatient Discharges (2008)



Source: New Hampshire Hospital Association

As depicted in the map below, the vast majority of the critical access hospitals are located in the most rural northern reaches of the state. With the most rural areas of Maine and Vermont to the east and the west, and a northern boundary with Canada, the hospitals and physician practices in this part of the state serve a patient population which, though small, has very few alternative sources of care available to them.

Figure 5: Location of New Hampshire Hospitals



As noted earlier, a key feature of the New Hampshire health care delivery landscape is that hospitals own or strongly affiliate with a large number of ambulatory physician practices in the market. Our current estimate, based on a detailed survey created for this plan of 18 of the 26 hospitals in the state reveals the following. (Note: Responding hospitals include Alice Peck Day Memorial Hospital, The Cheshire Medical Center, Concord Hospital, Dartmouth Hitchcock Medical Center, Elliot Hospital, Exeter Hospital, Huggins Hospital, Lakes Region General Hospital, Littleton Regional Hospital, The Memorial Hospital, Monadnock Community Hospital, New London Hospital, Parkland Hospital, Speare Memorial Hospital, Southern New Hampshire Hospital, Upper Connecticut Valley Hospital, Valley Regional Hospital, and Weeks Medical Center.)

Table 3: % of Ambulatory practices and clinicians that are hospital employed, “affiliated,” or independent

	Employed	“Affiliated”	Independent	Total
Ambulatory practices	421 (37%)	125 (11%)	591 (52%)	1,137
Ambulatory clinicians	2,467 (57%)	397 (9%)	1,486 (34%)	4,350

Source: HIEPI Survey of Selected Hospital CIOs, July 8 2010

“Affiliated” in this case refers to the inclusion of a non-owned practice in a hospital’s health IT planning, either with respect to EHRs or health information exchange. Thus, over 2800 (66%) of New Hampshire’s 4350 practicing ambulatory physicians are expected to derive their health information exchange capabilities through a hospital network, leaving just under 1500 (34%) ambulatory clinicians outside of the existing health exchange networks.

The high degree of hospital ownership in the state has driven high EHR penetration. Almost 60% of ambulatory physicians have electronic health records, far exceeding the national average.

Table 4: Ambulatory EHR Penetration

	EHR	No EHR	Total
Ambulatory practices	437 (38%)	701 (62%)	1,137
Ambulatory clinicians	2464 (57%)	1886 (43%)	4,350

Source: HIEPI Survey of Selected Hospital CIOs, July 8 2010

Consistent with EHR adoption characteristics nationally, penetration is higher among larger practices than smaller ones. Thus, the 38% of practices that have an EHR account for almost 60% of all of the physicians in the state. Breaking the data down by hospital ownership status, EHR use is much higher among clinicians that are employed by or affiliated with hospitals, approaching 90% among employed and 60% among affiliated clinicians.

Not only is penetration of EHRs quite high, adoption (ie, use of many key functions) appears to be quite high as well. A UNH survey conducted for this planning effort found that of those practices having an EHR, a large fraction report regular use of several EHR key capabilities.

Table 5: Use of EHR Capabilities by Practices with EHRs

EHR Capability	% of Respondents Using Capability
Patient demographics (name, address, etc...):	95%
Patient medications/prescriptions	87%
Past medical history	82%
Integration with practice billing system	79%
Referrals to specialists for patient consultations (logged note of referral)	68%
Consults/reports from specialists:	68%
Laboratory results (Receiving patient lab results from other providers)	67%
Drug interaction warnings (Both pulling patient drug use from other providers and receiving drug information from other providers specific to the patient)	64%
Radiology/imaging results	64%
Laboratory test ordering(ability to order lab tests electronically)	62%
Drug reference information (look up information)	62%
Electronic prescribing (electronic links to pharmacies):	62%
Clinical guidelines and protocols (from best practice literature)	61%
Drug formularies (drugs covered by the patient’s insurance)	44%

Source: University of New Hampshire Institute for Health Policy and Practice 2010 survey

Taken together, the data on EHR adoption bodes well for the future potential of HIE activity in the state. Clinical data can be exchanged electronically only if it’s first captured electronically. The high fraction of practices in the state that have both implemented and adopted EHRs in their day-to-day practice suggests that much clinically beneficial information could be made available once appropriate and comprehensive exchange policies, processes, and technologies are put in place.

In addition to hospital networks, New Hampshire has a number of other advanced organizations that are driving greater interoperability of systems across settings. These organizations include The Community Health Access Network (CHAN is a well established health center controlled network), North Country Health Consortium, and technologically sophisticated Home Health organizations. These “HIE clusters” of information technology have made significant investments in technology, people, and learning for many years and represent additional capacity that the SOP can build upon.

Based on this analysis, the SOP must take into account the following gaps in HIT adoption and HIE network participation among ambulatory providers.

Table 6: Gaps in HIT Adoption

#	Current Gap	Recommendation
1	A substantial fraction (43%) of ambulatory providers do not have EHRs	Help coordinate the efforts of programs focused on HIT adoption within the State (e.g., Regional Extension Center program, Medicaid planning, private health plan incentive programs)
2	A substantial fraction (34%) of ambulatory clinicians are not part of existing hospital HIE activities and planning	Devise policy and/or technology approaches to facilitate creation of new networks or expansion of existing networks to include independent ambulatory practices and other ambulatory entities

The state of health information exchange in New Hampshire

As noted earlier, New Hampshire has a large amount of HIE activity today, the vast majority of which is conducted within hospital networks covering employed and affiliated practices. The hospital CIO survey conducted for this SOP assesses which HIE transactions are being conducted by hospital and organizations in the state today.

In order to assess the areas of current capacity and corresponding gaps, a reference list of 52 possible HIE transactions was assembled. This list was derived by from a number of sources, including:

- **ONC Program Information Notice (July 6, 2010)**
- **New Hampshire Hospital Association State-Level HIE Vision/Principles/Services/Value/Strategies Framework (May 11, 2010)**
- **HIEPI Domain Working Groups (Summer 2010)**
- **American Health Information Community (AHIC) Use Cases and Extensions/Gaps (<http://www.hhs.gov/healthit/usecases/>)**
- **NHIN Direct User Stories (<http://nhindirect.org/User+Stories>)**
- **New York State HEAL 5 Clinical Investment Priority Use Cases (http://www.health.state.ny.us/technology/projects/clinical_investment_priorities.htm)**

The reference use cases that served as the basis for the planning effort are shown below:

Table 7: New Hampshire SOP Reference Use Cases

What	From whom	To whom
Claims submission & eligibility checking	Hospital	Health plan
Claims submission & eligibility checking	PCP or specialist	Health plan
Consult note -- Summary of care record	Specialist	PCP
Discharge instructions	Hospital	Patient
eRX	PCP or specialist	Pharmacy
General medical summary	PCP or specialist	Patient
Hospital admission notification	Hospital	Referring Hospital
Hospital admission notification	Hospital	Referring physician and/or PCP
Hospital discharge summary	Hospital	Hospital
Hospital discharge summary	Hospital	Other care settings
Hospital discharge summary	Hospital	Referring physician and/or PCP
Hospital ED visit summary	Hospital	Referring physician and/or PCP
Image exchange	Hospital	PCP or specialist
Image exchange	Imaging center	PCP or specialist
Imaging order	PCP or specialist	Imaging center
Imaging reports	Hospital	PCP or specialist
Imaging reports	Imaging center	PCP or specialist
Immunization record	Hospital	Public health
Immunization record	PCP or specialist	Public health
Key clinical information summary	Hospital	Hospital
Key clinical information summary	PCP or specialist	Hospital
Lab order	PCP or specialist	Hospital
Lab order	PCP or specialist	National lab
Lab results	Hospital	PCP or specialist
Lab results	National lab	PCP or specialist
Lab results	Public health lab	Hospital
Lab results	Public health lab	PCP or specialist
Laboratory ordering decision support	Payers	PCP or specialist and hospitals
Medication history	Other clinical sources	Hospital
Medication history	Other clinical sources	PCP or specialist
Medication history	Pharmacy	Hospital
Medication history	Pharmacy	PCP or specialist
Merged community-wide record	Multiple sources	Hospital
Merged community-wide record	Multiple sources	PCP or specialist
Post-visit summary	PCP or specialist	Patient
Public health alerts	Public health	Hospital
Public health alerts	Public health	PCP or specialist
Public health case investigation information	Hospital	Public health
Public health case investigation information	PCP or specialist	Public health
Quality measures	Hospital	CMS and/or NH Medicaid
Quality measures	PCP or specialist	CMS and/or NH Medicaid
Radiation exposure report	Hospital	Radiation exposure registry
Radiation exposure report	Imaging center	Radiation exposure registry
Referral -- Summary of care record	PCP	Specialist
Referral -- Summary of care record	PCP or specialist	Hospital
Reportable conditions	Hospital	Public health
Reportable conditions	PCP or specialist	Public health
Reportable lab results	Hospital	Public health
Request for key clinical information	Hospital	Hospital
Request for key clinical information	Hospital	PCP or specialist
Syndromic surveillance data	Hospital	Public health
Syndromic surveillance data	PCP or specialist	Public health

As noted earlier, the vast majority of information exchange activity in the state today is being facilitated by hospitals. The hospital CIO survey gauged the current and planned capabilities of these hospital networks.

Table 8: Percent of Hospitals Performing Selected HIE Transactions

Health Information Exchange Transaction	Sender	Receiver	% doing transaction
Claims submission & eligibility checking	Hospital	Health plan	88%
Imaging reports	Hospital	PCP or specialist	81%
Lab results	Hospital	PCP or specialist	81%
Images	Hospital	PCP or specialist	75%
Syndromic surveillance data	Hospital	Public health	69%
Hospital discharge summary	Hospital	Referring physician and/or PCP	69%
Quality measures	Hospital	CMS and/or NH Medicaid	63%
Hospital discharge summary	Hospital	Other care settings (e.g., VNA, SNF, etc)	56%
Hospital ED visit summary	Hospital	Referring physician and/or PCP	50%
Hospital admission notification	Hospital	Referring physician and/or PCP	50%
Lab order	PCP or specialist	Hospital	50%
Immunization record	Hospital	Public health	38%
Lab results	Public health lab	Hospital	38%
Reportable lab results	Hospital	Public health	38%
Reportable conditions	Hospital	Public health	31%
Public health alerts	Public health	Hospital	25%
Hospital discharge summary	Hospital	Hospital	25%
Medication history	Pharmacy	Hospital	19%
Discharge instructions	Hospital	Patient	19%
Request for CCD medical summary information	Hospital	PCP or specialist	13%
Referral -- Summary of care record	PCP or specialist	Hospital	13%
Public health case investigation	Hospital	Public health	13%
Radiation exposure report	Hospital	Radiation exposure registry (proposed)	6%
Hospital admission notification	Hospital	Referring Hospital	6%
Request for CCD medical summary information	Hospital	Hospital	6%
CCD medical summary	Hospital	Hospital	6%
CCD medical summary	PCP or specialist	Hospital	6%
Community record	Multiple sources	Hospital	6%
Medication history	Other clinical sources	Hospital	6%

Source: HIEPI Survey of Selected Hospital CIOs, July 8 2010

As shown in the table, there is a considerable amount of exchange activity in the state today, focused primarily on making electronic those transactions which are required for payment or by law, such as claims and eligibility, delivery of diagnostic results, and required public health reporting. Transactions outside of these requirements, and/or that involve the hospital receiving (rather than sending) information have received relatively less emphasis to date.

While there is much commonality in *what* is being exchanged, there is considerably more variation in *how* this information is exchanged. Because up until very recently there have been no requirements or incentives in the market today dictating standards or modes of exchange, entities that are exchanging information have deployed a wide array of approaches according to their own priorities and capabilities. As shown in the table below, health information exchange happens in a wide variety of channels at present, including web portals, electronic interfaces, fax, paper mail, email, or phone. The table shows the estimated number of hospitals in the state that are conducting HIE transactions through each of these channels.

Table 9: Summary of health information transactions by transaction channel

Health Information Exchange Transaction	Sender	Receiver	Portal	Interface	Fax	Paper	email	Phone	Other	Multiple	% doing action
Claims submission & eligibility checking	Hospital	Health plan	0%	81%	0%	0%	0%	0%	6%	0%	88%
Imaging reports	Hospital	PCP or specialist	19%	19%	13%	0%	6%	0%	0%	25%	81%
Lab results	Hospital	PCP or specialist	19%	19%	13%	0%	6%	0%	0%	25%	81%
Images	Hospital	PCP or specialist	63%	0%	0%	0%	0%	0%	6%	6%	75%
Syndromic surveillance data	Hospital	Public health	0%	50%	0%	6%	0%	0%	13%	0%	69%
Hospital discharge summary	Hospital	Referring physician and/or PCP	19%	6%	25%	0%	6%	0%	0%	13%	69%
Quality measures	Hospital	CMS and/or NH Medicaid	6%	13%	0%	13%	0%	0%	31%	0%	63%
Hospital discharge summary	Hospital	Other care settings (e.g., VNA, SNF, etc)	25%	0%	19%	6%	6%	0%	0%	0%	56%
Hospital ED visit summary	Hospital	Referring physician and/or PCP	13%	6%	13%	0%	6%	0%	0%	13%	50%
Hospital admission notification	Hospital	Referring physician and/or PCP	13%	6%	6%	0%	6%	6%	0%	13%	50%
Lab order	PCP or specialist	Hospital	19%	13%	6%	6%	0%	0%	0%	6%	50%
Immunization record	Hospital	Public health	19%	0%	0%	6%	0%	0%	13%	0%	38%
Lab results	Public health lab	Hospital	13%	13%	6%	6%	0%	0%	0%	0%	38%
Reportable lab results	Hospital	Public health	13%	6%	0%	6%	0%	0%	13%	0%	38%
Reportable conditions	Hospital	Public health	0%	19%	0%	6%	0%	0%	6%	0%	31%
Public health alerts	Public health	Hospital	0%	6%	6%	6%	6%	0%	0%	0%	25%
Hospital discharge summary	Hospital	Hospital	13%	0%	13%	0%	0%	0%	0%	0%	25%
Medication history	Pharmacy	Hospital	6%	6%	0%	6%	0%	0%	0%	0%	19%
Discharge instructions	Hospital	Patient	13%	0%	0%	0%	0%	0%	0%	6%	19%
Request for CCD medical summary information	Hospital	PCP or specialist	0%	0%	0%	6%	6%	0%	0%	0%	13%
Referral -- Summary of care record	PCP or specialist	Hospital	0%	0%	6%	6%	0%	0%	0%	0%	13%
Public health case investigation	Hospital	Public health	0%	6%	0%	6%	0%	0%	0%	0%	13%
Radiation exposure report	Hospital	Radiation exposure registry (proposed)	0%	0%	6%	0%	0%	0%	0%	0%	6%
Hospital admission notification	Hospital	Referring Hospital	0%	0%	0%	6%	0%	0%	0%	0%	6%
Request for CCD medical summary information	Hospital	Hospital	0%	0%	0%	6%	0%	0%	0%	0%	6%
CCD medical summary	Hospital	Hospital	0%	0%	0%	6%	0%	0%	0%	0%	6%
CCD medical summary	PCP or specialist	Hospital	0%	0%	0%	6%	0%	0%	0%	0%	6%
Community record	Multiple sources	Hospital	0%	0%	0%	6%	0%	0%	0%	0%	6%
Medication history	Other clinical sources	Hospital	0%	0%	0%	6%	0%	0%	0%	0%	6%

Source: HIEPI Survey of Selected Hospital CIOs, July 8 2010

While a considerable HIE infrastructure exists in the state today, there is still a considerable gap between current approaches and what is required for meaningful use. A relatively small portion of total transactions are conducted via electronic interfaces, for example. While portals are an acceptable approach for information-sharing with employed ambulatory practices, practices that are affiliated but not employed will require standards-based interfaces for key transactions such as labs and summary of care records in order to meet their MU requirements. As shown, the only transactions for which more than 50% of hospitals are using electronic interfaces today are administrative transactions and automated reporting to the state department of health for the AHEDD syndromic surveillance program.

Thus, while much health information exchange does occur in the state, there remains considerable opportunity for increasing the volume of health information exchange and facilitating changes in the way in which it occurs to align it with federal and industry standards.

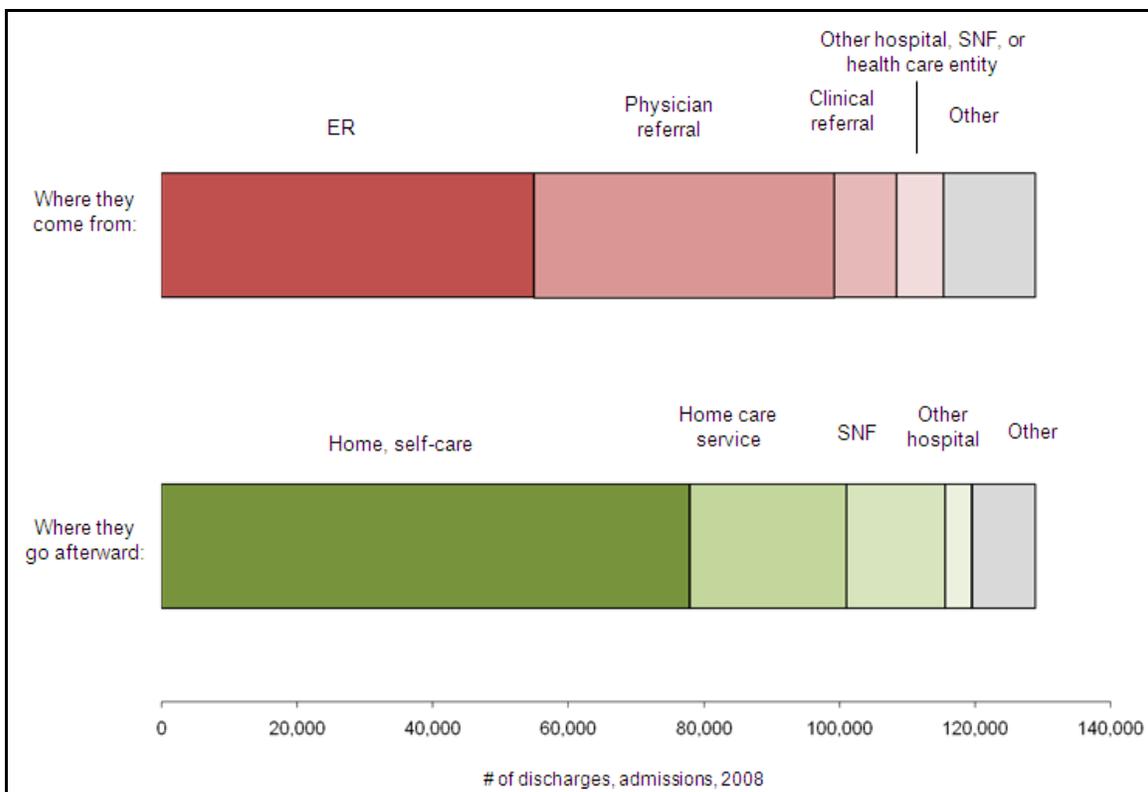
With that as overview, the following sections provide details on the state of particular transitions, focusing on the ONC PIN requirements.

The state of patient care summary exchange in New Hampshire

Summary care record transfers occur when patients transition from one care setting to the next. Such records include referrals from PCPs to specialists and/or hospitals, consult reports from specialists back to PCPs, and hospital discharge summaries and ED visit summaries. One way of measuring the need for such exchange is to assess the level and nature of care transitions. While this information is difficult to get in the ambulatory sector, the New Hampshire Hospital Association maintains data on a variety of hospital transactions, including the sources of hospital admissions and the disposition of patients upon discharge.

The figure below shows the aggregate breakdown of patient flow to and from hospitals during 2008 (the latest data available: http://www.nhha.org/nhha/healthcare_data/inpatient.php#InpStd).

Figure 6: Summary of Where Hospital Patients Come From and Where They Go



Source: New Hampshire Hospital Association, inpatient reports by NH hospitals, http://www.nhha.org/nhha/healthcare_data/inpatient.php#InpStd

The top of the graph shows the sources of admissions to all hospitals in the state. Of the roughly 130,000 hospital admissions in New Hampshire in 2008, approximately 75% came either from emergency rooms or from physician or outpatient clinic referrals. The remaining 25% derive from a variety of sources.

Upon discharge, almost 60% transition to self-care, and another 35% transition either to home care services, long-term care facilities, or other hospitals.

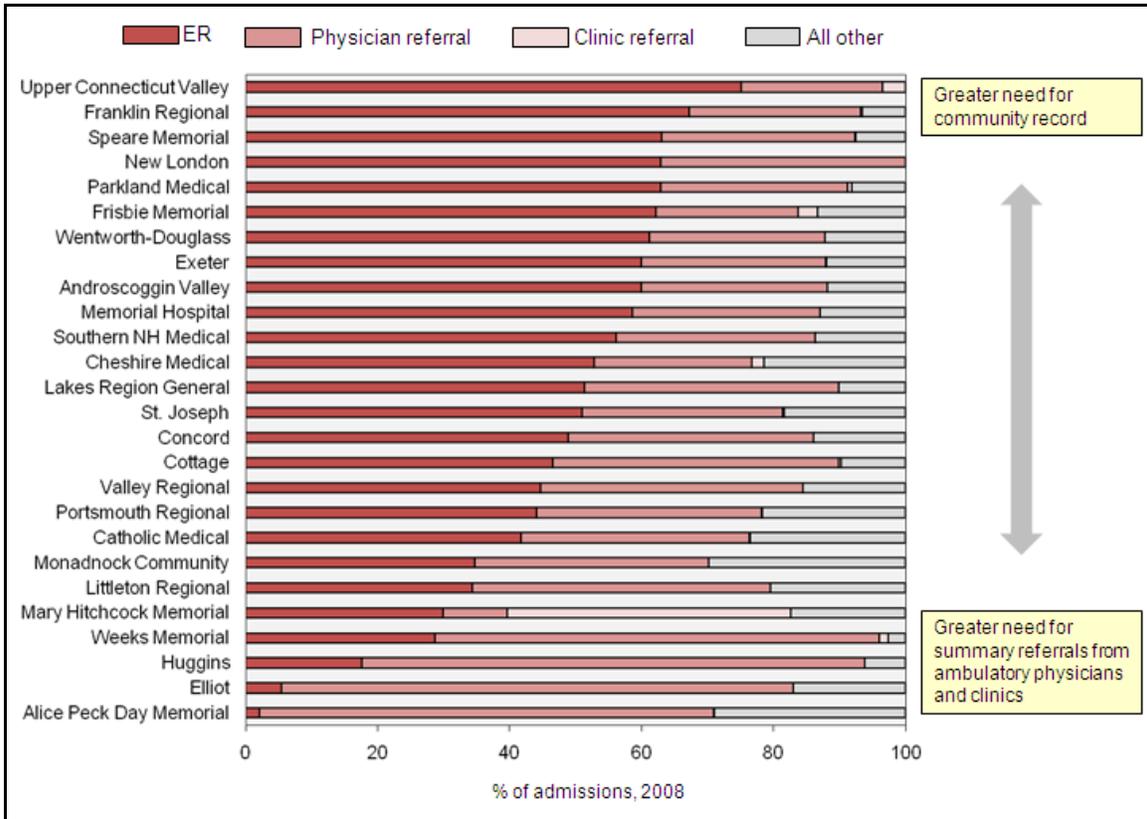
This depiction, though high-level, provides valuable insights into which types of patient care summary transfers will have the greatest impact in quality of care. Roughly 42% of patients were admitted to the hospital through the ED, which itself may have limited background information on patients, suggesting that access to data that has already been collected and is readily available to clinicians (such as in a repository or community-wide record) would be the most beneficial type of exchange for these types of admissions. Almost half of patients (46%) are admitted through referrals from another health care entity. Such transfers do not require “on-demand” access to information by the hospital and can be supported instead through referral transactions from one institution to the next.

On the discharge side of the equation, the roughly 60% of patients who go to self-care would be best supported through discharge instructions to the patient and discharge summaries to the PCP and/or referring physician. Most of the remaining discharges are transfers to home health services or long-term care facilities, suggesting that the ability to routinely provide discharge summaries to these types of institutions would give a tremendous boost to continuity of care in the state.

Overall, this analysis reveals that hundreds of thousands of transitions of care occur annually among New Hampshire’s hospitals, physicians, community health centers, clinics, home health services, skilled nursing facilities, and other providers or care settings. This presents large risks for breakdowns in the continuity of care while encouraging duplication of services, tests, and administrative record keeping for providers and patients alike. This also presents an opportunity to improve patient care, lower overall costs, reduce hospital re-admissions, and improve efficiency through better coordination and information sharing through transfers of care.

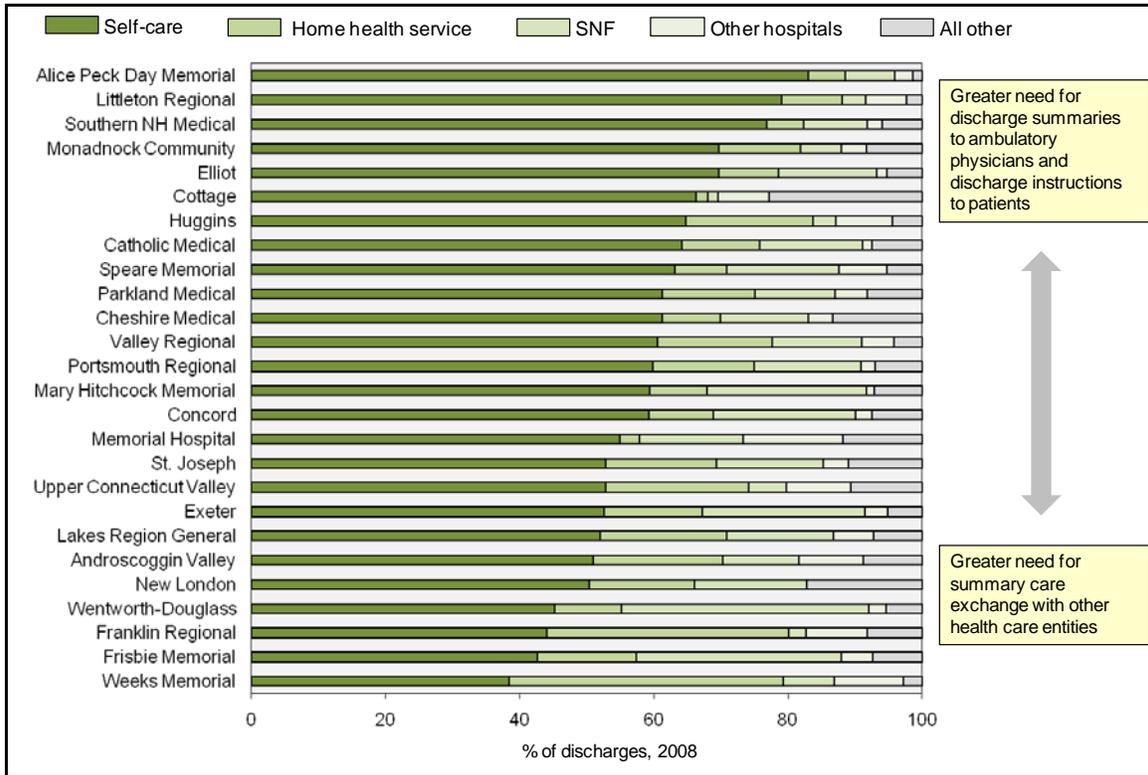
Another factor to note in the environmental scan of patient care summary exchange is that there is tremendous heterogeneity across the hospitals in the state. Disaggregating the data from the previous analysis to the hospital-level yields the following breakdowns by hospital.

Figure 7: Inpatient Admissions by Admissions Source



Source: New Hampshire Hospital Association, inpatient reports by NH hospitals, http://www.nhha.org/nhha/healthcare_data/inpatient.php#InpStd

Figure 8: Inpatient Discharges by Destination



Source: New Hampshire Hospital Association, inpatient reports by NH hospitals, http://www.nhha.org/nhha/healthcare_data/inpatient.php#InpStd

As shown in the figures, there is a high degree of heterogeneity among hospitals both in terms of sources of admissions as well as disposition of patients post-discharge. This analysis highlights both the need for creating an approach that is aligned with the main avenues of patient flow and the approach flexible enough to accommodate differences among hospitals.

We note that this analysis only addresses flows of patients to and from hospital inpatient settings. For example, it does not capture the considerable amount of patient transitions that occur solely in the ambulatory setting, such as PCP to specialist. Unfortunately, comparable data on ambulatory-to-ambulatory transitions are not available. From the All Payers Claims Database, we know that in 2009, 61% of the 9.4 million claims processed in New Hampshire were for physician office visits. The New Hampshire all-payer claims database may allow some high-level analysis of patient flows in the ambulatory setting, which we are investigating now and will present any results in future updates to this plan. To the extent that the existing New Hampshire HIE infrastructure exists within hospital networks and comprises predominantly hospital-to-ambulatory transactions, as shown in table 4, this would clearly be a large gap area in the current environment.

Table 10: Gaps in HIE Capability

#	Current Gap	Recommendation
3	There is considerable summary care exchange activity within hospital networks in the state today, but relatively little of it is MU-compliant and the majority is focused on unidirectional information from the hospital to ambulatory providers	Support exchange of electronic patient health information for purposes of care coordination among organizations and healthcare stakeholders

4	There is almost no MU-compliant summary care exchange capability among ambulatory providers, from ambulatory settings back to hospitals, or across hospital networks	Give high priority to developing solutions for MU-compliant summary care exchange in these gap areas. Develop an approach to address summary care exchange needs of independent practices outside of hospital networks, and exchange capacity across hospital networks.
5	There is a high degree of heterogeneity across hospital networks in the level and types of HIE activities being supported, as well as in their readiness for MU.	Conduct detailed assessment of MU-readiness of each network, and develop program to facilitate achievement of HIE core capability across all hospital networks

The state of e-Prescribing in New Hampshire

In 2009, only about 12% of eligible prescription transactions were routed electronically in New Hampshire, placing the state 30th in the country. Yet, the state has the infrastructure in place to have much higher ePrescribing (eRX) usage than is occurring today: As described earlier, EHR penetration is quite high in the state at large and, of the 294 licensed pharmacies in the state, approximately 96% are activated for eRX transactions and refill requests.

Table 11: NH Pharmacy Adoption Metrics

Measure	2007	2008	2009
Adoption Metrics			
Physicians Routing Prescriptions at Year End	106	246	272
% Physicians Routing Prescriptions electronically	5%	11%	12%
Community Pharmacies Activated for E-Prescribing at Year-End ³	222	233	244
% Community Pharmacies with ePrescribing activated	91%	91%	96%
% Patients with available prescription benefit/ history information	51%	65%	66%

Source: SureScripts State Progress Reports, www.surescripts.com, SureScripts endnotes below:
3. Pharmacy calculations use NCPDP-supplied data showing total numbers of community pharmacies in each state.
4. Total number of physicians per state sourced from Physician Characteristics and Distribution in the US, 2010 ed. (Chicago: American Medical Association). In addition to physicians, nurse practitioners and physician assistants may also e-prescribe in your state. For a list of e-prescribers in your area, visit www.surescripts.com.

There appear to be gaps both in the number of clinicians prescribing, as well as in their use of the full set of functions that eRX has to offer. Only 272 clinicians were active eRX users in 2009, representing a small fraction of the physicians with EHR systems already in place. Use of high-value features such as renewal response (12%), RX eligibility (29%), and medication history (3%) were all extremely low, even though there has been significant growth in these transactions over the past 2 years.

Table 12: NH Pharmacy Utilization Metrics

Measure	2007	2008	2009
E-Prescribing Utilization Metrics			
Prescription Benefit Requests	200,675	308,077	1,334,862
% Patient Visits involving prescription benefits request	6%	8%	29%
Rate of Response to Benefit Requests at Year-End	43.62%	62.81%	74.21%
Total Prescriptions Routed Electronically ¹	127,396	183,501	762,224
% Eligible Prescriptions routed electronically	2%	3%	12%
% of Total Prescriptions Represented by Renewal Response	12.70%	18.83%	16.53%
Total Estimated Responses to Medication History Requests ²			160,942
% Patient Visits involving medication history response			3%

Source: SureScripts State Progress Reports, www.surescripts.com, SureScripts endnotes below:
 1. Eligible prescriptions do not include controlled substances, which were not eligible for e-prescribing under 2009 DEA regulations, or preauthorized refills on existing prescriptions, because they do not require communication between a physician and a pharmacist. Total benefit transactions reflect adjustment of 15% to reflect potential duplicate coverages.
 2. Prescription/medication history data based on available data for Q4 2009 only. No seasonality is assumed. Method will adjust in future years as full-year data becomes available.
 4. Total number of physicians per state sourced from Physician Characteristics and Distribution in the US, 2010 ed. (Chicago: American Medical Association). In addition to physicians, nurse practitioners and physician assistants may also e-prescribe in your state. For a list of e-prescribers in your area, visit www.surescripts.com.

Given that most clinicians have EHRs and are capable of e-prescribing and that the community pharmacies are nearly all capable of receiving e-prescriptions, cost and workflow training are likely deterrents to adoption of these services. It is possible that the relatively low (66%) percentage of patients with available benefit/history information could also be a barrier to greater adoption. We note that many other states with equally low patient coverage (below 70%) have low eRX rates as well, including Georgia (17%), Florida (19%), Virginia (15%), and Wyoming (12%). Our approach to increasing eRX penetration in the state will be to investigate the barriers to higher adoption of eRX through existing technology channels and address those barriers through communication, outreach, and alignment of efforts and through policy changes at the state-level if necessary.

We will formalize a program to assess eRX penetration within each HIE cluster and outside of the clusters and develop statewide goals for eRX adoption and, measurement and feedback programs to assess progress over time and identify persistent gaps. We will use innovative approaches and best practices from other nationwide initiatives such as the Blue Cross Blue Shield-Tufts eRX Collaborative in Massachusetts and the Central Indiana eRX Initiative sponsored by the Employers’ Forum of Indiana. A particularly useful approach adopted in the Indiana program was to bring prescribing providers and pharmacists together to understand each others’ systems and workflows to gain end-to-end visibility of eRX transactions and better understanding of the implications of non-standard use on either end of the transaction. Given that New Hampshire already has very high penetration of eRX systems in pharmacies, and relatively high penetration of EHRs, this might be an especially effective approach in the state since workflow and system usability, rather than technology availability, are likely to be the keys to rapid progress in this area. We do not believe that investment in statewide technology infrastructure related to eRX is warranted at this time.

Table 13: Gaps in HIE Capability

#	Current Gap	Recommendation
6	88% of Providers are not e-Prescribing and 4% of community	Encourage eRX adoption through outreach and education in coordination with MU incentives and prospective REC. No need to

	pharmacies are not set up for e-prescribing	create infrastructure, adequate e-prescribing capabilities are commercially available
7	Patient coverage for benefit/history information is relatively low (66%)	Identify drivers of low patient coverage and develop program to expand coverage.

The state of lab results delivery in New Hampshire

In general, the state has extremely high levels of electronic lab results delivery. The vast majority of labs are processed and billed by hospitals, as shown by data on lab claims derived from the states All-Payer Claims Database. As shown below, in 2009 the top 20 hospital labs in the state accounted for well over 90% of all lab claims paid in the state.

Table 14: % total lab claims by all clinical labs (Note: Cumulative % in right column)

Facility name	Lab claims	% of total	Cumulative %
Concord Hospital	310,458	17%	17%
Mary Hitchcock Memorial Hospital	218,428	12%	29%
Elliot Hospital	212,399	12%	41%
Southern NH Medical Center	158,414	9%	49%
St Joseph Hospital	105,586	6%	55%
Catholic Medical Center	84,924	5%	60%
Lakes Region General Hospital	81,121	4%	64%
Wentworth Douglass Hospital	75,647	4%	68%
Portsmouth Regional Hospital - HCA Affiliate	74,275	4%	73%
Frisbie Memorial Hospital	49,846	3%	75%
New London Hospital	42,449	2%	78%
Exeter Hospital	38,446	2%	80%
Monadnock Community Hospital	38,349	2%	82%
Huggins Hospital	32,473	2%	84%
Parkland Medical Center	30,225	2%	85%
Speare Memorial Hospital	30,178	2%	87%
Androscoggin Valley Hospital	29,782	2%	89%
Franklin Regional Hospital	27,359	2%	90%
Littleton Regional Hospital	24,754	1%	91%
Cheshire Medical Center	24,417	1%	93%

Source: State of New Hampshire, All-Payer Claims Database

More generally, there are 59 Clinical Laboratory Improvement Amendments (CLIA) accredited or compliant laboratories operating in the state. A July 2010 phone survey conducted for this SOP shows that approximately 75% of all of the labs in the state have electronic reporting capabilities already in use. Yet, as shown in Table 5 earlier, only 19% of hospitals reported EHR interfaces as their primary means of lab results delivery. Thus, while most labs do have the ability to deliver labs electronically, most lab results are still delivered through a wide variety of modes such as paper, fax, email, and portals, none of which are MU-compliant.

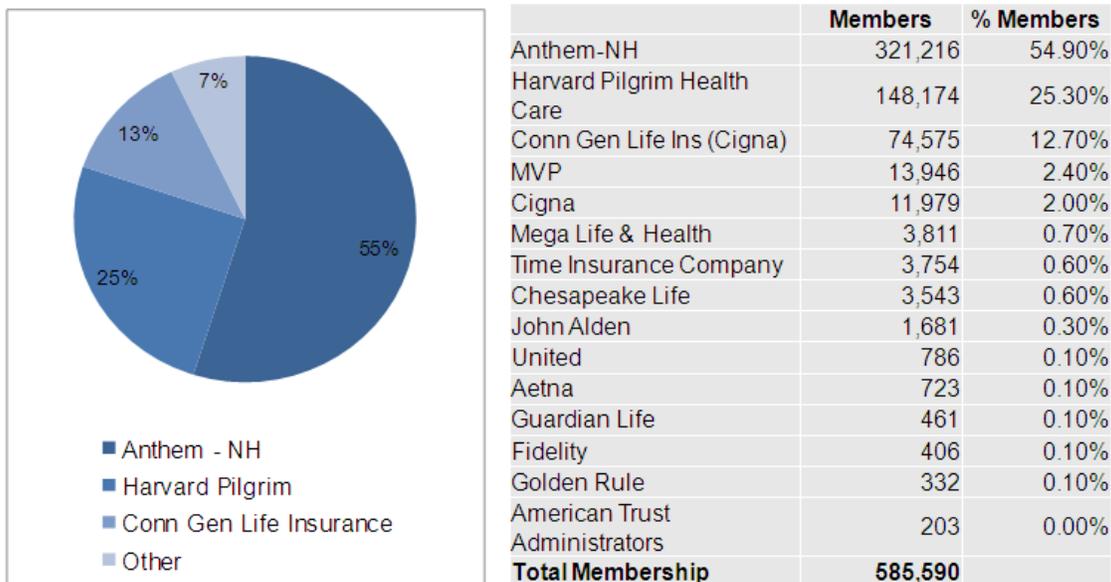
Table 15: Gaps in HIE Capability

#	Current Gap	Recommendation
8	25% of clinical laboratories do not have capability to send outpatient lab results via an EHR interface	Encourage development of lab EHR interfacing capabilities through outreach, education, and policy guidance
9	Over 80% of lab hospital labs do not use EHR interfaces as the primary means of lab results delivery to ambulatory practices.	Encourage labs to shift delivery of results to EHR interface channel through outreach, education, and policy guidance

The state of electronic claims submission and eligibility-checking in New Hampshire

The commercial health insurance market in New Hampshire is highly consolidated with 3 health plans representing 93% of all commercial health insurance members. The 3 dominant carriers are capable of supporting electronic claims and eligibility checking. (Note: Data is based on policyholder (employer) so includes members that work in NH regardless of residence and excludes NH residents that work out of state)

Table 16: Commercial Health Plan Providers and Members (2008)



Source: SUPPLEMENTAL REPORT OF THE 2008 HEALTH INSURANCE MARKET IN NEW HAMPSHIRE, Prepared by the New Hampshire Insurance Department, October 22, 2009, http://www.nh.gov/insurance/iah/documents/suprep_08.pdf

The State Medicaid program is also capable of supporting electronic claims submission and eligibility checking. New Hampshire providers have a very robust capability for administrative transactions associated with verifying patient eligibility for coverage and for electronic claims submission. However, as noted in the Table 4 survey results of hospital CIOs, almost 20% of hospitals are not taking full advantage of these capabilities to date due to the cost of clearinghouse access to these services.

Table 17: % Health Plans supporting electronic claims submission and eligibility checking

Health Plan/Payer	Capability for electronic Claims Submission	Capability for electronic Eligibility Checking
Anthem	Yes	Yes
Harvard Pilgrim Health Care	Yes	Yes
Conn Gen Life Ins (Cigna)	Yes	Yes
Medicaid	Yes	Yes
Total	100%	100%

Source: MAeHC phone interviews, July 2010.

Table 18: Gaps in HIE Capability

#	Current Gap	Recommendation
10	Although the dominant payers are capable of supporting electronic claims submission and eligibility checking, a portion of providers (~20% of hospital system owned/affiliated providers) are not using this capability.	Encourage adoption through outreach and education in coordination with MU incentives and prospective REC – No need to create infrastructure, adequate capabilities are commercially available

The state of public health reporting in New Hampshire

In new Hampshire each of the state's 234 municipalities have an appointed health officer, the majority providing a very limited range of services focusing on enforcing environmental and nuisance statutes and informing and educating the public. There are two comprehensive local health departments; the City of Manchester Department of Health, and the City of Nashua Division of Public Health and Community Services. For the rest of the state those functions are performed by the Division of Public Health Services (DPHS) under the State Department of Health and Human Services. The NH DPHS also funds 15 entities, each of which serves a defined geographic region for purposes of public health emergency planning and response. Some of these entities also receive funding from the NH DPHS and other funders to provide services that include informing and educating the public; mobilizing partnerships; and linking people to health care services. Outside of Manchester and Nashua, in the absence of comprehensive local public health departments, the local hospital systems provide services to inform and educate the public about health issues and improve access to care as part of their community benefits programs.

There are 35 systems currently in place at the State level for public health reporting. A few of the systems are capable of electronic exchange of information while the majority of systems require gathering and submission of information via paper, fax, email or phone channels followed by manual entry of data. These systems are critical for public health and many require the use of identifiable information in order to carry out the public health duties under law. The systems exist behind the State's firewall and have all the built-in intrusion detection, antivirus, anti-malware and other state-of-the art protections expected in an enterprise level security environment. Access is limited to individuals who have a work-related need to view this data and who are required to execute privacy oaths before access is granted.

Table 19 provides information on the electronic information received by full service public health departments in New Hampshire. Details on public health systems follow the table.

Table 19: Full service public health departments electronically receiving personal health information

	Electronically receiving immunizations information?	Electronically receiving syndromic surveillance information*?	Electronically receiving notifiable lab results?
NH DHHS - Division of Public Health Services	No	Yes	Yes, but only from State Public Health Lab
City of Manchester Department of Health	No	No	Yes
City of Nashua Division of Public Health and Community Services	No	No	Yes
% of full services public health departments electronically receiving immunizations, syndromic surveillance, and notifiable lab results	0%	33%	100%

**Note: electronic syndromic surveillance information comes only from hospital emergency departments.*

Discharge and claims data collection and use

New Hampshire has several systems in place to collect discharge and claims information:

- Uniform Hospital Discharge Data Collection System - Since 1985 DHHS has collected hospital discharge data (under RSA 126:25) through the Uniform Hospital Discharge Data Collection System. Data is currently collected from all acute care and specialty hospitals licensed under RSA 151. Data from acute care facilities includes both inpatient (general and specialty) and outpatient discharges. Data from the hospital discharge data collection system is analyzed by DHHS staff to generate public health and health care statistics for use by DHHS, other state agencies, other interested organizations, and the public. Subject to confidentiality restrictions under RSA 126:28, He-C 1500, and HIPAA regulations, DHHS provides public use data sets without restriction and releases the extracts of the data set to other state agencies, researchers, and others wishing to perform their own analysis of the data. Data is submitted electronically by hospitals to DHHS's through secure transmission through the Internet.
- New Hampshire Comprehensive Health Care Information System (NHCHIS) - Since 2005 DHHS has collected commercial insurance claims data (under RSA 420-G:11). The NHCHIS is a joint project with the New Hampshire Insurance Department (NHID). Data is currently collected on all New Hampshire residents who are insured or whose claims are processed by a carrier or third party administrator licensed in NH. Data is used by DHHS as a comparison to rates, cost, utilization, and quality in the Medicaid program and to generate public health statistics. NHID uses the data for analysis of the commercial health care system. Subject to confidentiality restrictions the data is available to researchers. A public use data set is available without restriction.

Immunization and vaccine tracking

There are no electronic systems in place at this time for immunization tracking at any of the 3 health departments. The State does use systems for immunization and vaccine reporting to the Centers for Disease Control and Prevention (CDC) including:

- Assessment; Feedback; Incentives; and eXchange (AFIX) and Clinic Assessment Software Application (CASA) tools. These tools require that paper-based survey data be filled out by pediatricians to report patient demographics and vaccine information which is then manually entered into a database for reporting to CDC.
- H1N1 Reporting and Analysis Tool - Healthcare providers & agencies administering vaccine submit vaccines administered by age group via paper reports, phone calls, and e-mail messages. Received information is manually entered into a database.
- Countermeasure and Response Administration System (CRA) - Healthcare providers & agencies administering vaccines send patient demographics and vaccine information to DHHS. Information is manually entered into a database and reported to the CDC via a web portal..

Syndromic surveillance

New Hampshire has several systems in place to facilitate syndromic surveillance:

- Automated Hospital Emergency Department Data (AHEDD) – Hospitals send emergency department data for early detection of Bioterrorism and naturally-occurring health risks. AHEDD uses an electronic data feed over VPN for reporting to the DHHS.
- BioSense and BioWatch – BioSense is a national program operated by CDC that provides real-time biosurveillance and health situational awareness for public health through use of existing data from healthcare organizations. Currently in place at Veterans Administration (VA) Medical System, LabCorp, and Department of Defense (DoD) facilities. The BioWatch Program uses a series of pathogen detectors co-located with Environmental Protection Agency (EPA) air quality monitors.
- The Bioterrorism Access Database (BT Access) – Public Health labs send patient demographic and disease condition, environmental data types, patient and environmental lab results. Information is manually entered into a database, reports are paper-based, and there is no reporting to authorities using this database.
- National Retail Data Monitor (NRDM) – Over-the-counter pharmaceutical sales reporting by syndromic category and zip code. An electronic data feed is collected and processed by the Real-Time Outbreak Detection and Surveillance (RODS) Laboratory at the University of Pittsburgh.
- Additional biosurveillance systems include Syndromic Tracking Encounter Management System (STEMS), school surveillance for absenteeism, and Influenza-like Illness (ILI) sentinel reporting.

Notifiable conditions

New Hampshire has several systems in place to facilitate notifiable lab results reporting:

- New Hampshire Electronic Disease Surveillance System (NHEDSS) - Hospital, public & private labs, and healthcare providers send patient demographics, lab results and disease condition to the DHHS. Submissions are via paper reports, phone calls, and e-mail messages as well as HL7 messages for those organizations that are capable. Standards based messages are imported while all other information is manually entered into a database and sent to the CDC.
- The Report of Verified Case of Tuberculosis (RVCT) is the national TB surveillance form. Data are collected by state and local TB programs, stored in the NH TB Database (LTBI database), and submitted to CDC through the Electronic Report of Verified Case of Tuberculosis tool (eRVCT) and the Tuberculosis Genotyping Information Management System (TGIMS).
- Systematic Tracking of Elevated Lead Levels and Remediation (STELLAR) - Labs performing lead poisoning screening tests submit paper reports, phone calls, and e-mail messages. Received

information is manually entered into a database or entered via State On-line Lead Activity Reporting (SOLAR) tool and sent to the CDC.

- Electronic Foodborne Outbreak Reporting System (EFORS) – Hospitals and labs submit paper reports, phone calls, and e-mail messages to DHHS. Received information is manually entered into a database and sent to the CDC.
- Perinatal Hepatitis B (Perinatal Hep) - Hospital, public & private labs, and healthcare providers send paper reports, phone calls, and e-mail messages to DHHS. Received information is manually entered into a database and sent to the CDC.
- Sexually Transmitted Disease*MIS – (STD*MIS) Hospitals and labs submit patient demographic, lab results and disease condition via paper reports, phone calls, and e-mail messages to DHHS. Received information is manually entered into a database and files are uploaded to the CDC.
- Electronic HIV AIDS Reporting System (eHARS)

Registries

- Cancer Registry - Healthcare providers send patient demographics, pathology reports, and treatment information to cancer registry via electronic reports, paper reports, faxes, phone calls, and e-mail messages. Received information is entered into database, goes through quality assurances and is sent to NH DHHS. This includes a Breast and Cervical Cancer System (BCCS).

Other public health systems

- Auris EHDI Tracking System and Perinatal Client Data Form (Auris) – Hospitals and birthing centers send patient demographics and hearing screening data to Community Health Services. Demographic data is imported from some hospital systems, hearing screens are imported from some hearing screening machines, and some reports are faxed in and entered manually by DPHS. Reporting to CDC is done by manual upload.
- Newborn Screening (Newborn) – Hospitals and birthing centers send patient demographics & lab results to Community Health Services utilizing University of Massachusetts system lab reports accessed via CITRIX. (Note: the New England Newborn Screening Program at University of Massachusetts is the contracted vendor for the state of NH to perform newborn screening for all infants born in NH. Newborn screening is a model public health program aimed at the early identification of metabolic disease.)
- Maternal-Child Health Datamart (Datamart) - Hospitals and midwives, the University of Massachusetts lab for newborn metabolic screening, and the NH Vital records system for births send birth and infant death files, newborn screening, and prenatal clinic data to Community Health Services. Information is sent via paper reports, phone calls, and e-mail messages which are manually entered into the database.
- Trauma Emergency Medical Services Information System (TEMSIS) - EMS first responders send several hundred data elements related to the emergency call including patient demographics and patient vital signs. Information is manually entered via a secure website.
- Radiological Administration Data System (RADS) - Facilities with radiation sources and transporters of radiation sources send information regarding facilities, radiation sources, machines, and associated data to DPHS. Paper reports, phone calls, and e-mail messages are received and information is manually entered into the database followed by non-electronic reporting to the nuclear regulatory commission (NRC).

- Communicator!NXT (HAN) - Health departments send critical information needed to respond to emerging health events to CDC and selected providers. Information is manually entered into a database and reported to CDC using a web based application.
- Additional Public Health Lab systems
 - Biomonitoring database (Biomonitoring)
 - Lab Information System (LITS) and associated external data analysis tools
 - LRN Results Messenger (LRN)
 - Lab Outbreak System (LOS)
 - Public Health Laboratory Information System (PHLIS)
 - eLEXNET - select food testing results are manually entered into FDA web based system

Table 20: Gaps in HIE Capability

#	Current Gap	Recommendation
11	Current state law prohibits an HIE entity from conducting public health information exchange with PHI	Support expansion of current law to allow an HIE entity to conduct public health transactions that are required by law and/or by meaningful use
12	No electronic immunization information is delivered from providers or hospitals to public health	*Support secure and private exchange of electronic immunization information to public health departments – this would allow the state to meet its immunization registry obligations under RSA 141-C:20
13	No electronic notifiable lab results are delivered from community labs to public health	*Support secure and private exchange of electronic notifiable lab results to public health departments
14	Limited electronic information flows to the city public health departments	*Support secure and private exchange of electronic immunization information, notifiable lab results, and syndromic surveillance information to city public health departments as appropriate
15	Current public health reporting systems are burdensome, inefficient, and rely upon transmission channels that are intrinsically difficult to secure: <ul style="list-style-type: none"> ▪ Hospitals, providers, and labs are required to report several types of information to public health through multiple disparate systems ▪ Data submission is often conducted through mail, fax, phone, and email transmission channels – public health has had to compensate for the security level of these channels by instituting policies and procedures to ensure the privacy and security of personal health information ▪ The State uses manual data entry processes for majority of information capture and reporting ▪ Multiple systems are required by law to use identified personal health information 	*Improve privacy, security, and efficiency, governance, and technical integrity of mandatory public health reporting – consider system consolidation and sunset transmission options that are less secure than new channels
*Not allowed to be conducted through an HIE entity according to current NH law.		

The state of patient access to health information in New Hampshire

The majority of patients do not have electronic access to their health information. According to the UNH 2010 survey, ~13% of practices provide a web based portal for patients. The number of patients that are using stand alone portals or portals linked to hospital or health insurer systems is unknown at present.

Table 21: Gaps in HIE Capability

#	Current Gap	Recommendation
16	The majority of practices do not provide patients with electronic access to their health information.	*Support secure and private exchange of health information with patients
*Note: Not allowed to be conducted through an HIE entity according to current NH law.		

The State of capacity to support exchange of health information in New Hampshire

As mentioned earlier, the majority of health information exchange capacity currently in place in New Hampshire exists within the hospital systems, CHAN, the North Country Health Consortium, and in some of the Home Health organizations. The majority of the State’s physicians work closely with the hospital systems to meet their health IT needs yet a minority do not have ready access to this capacity.

Currently there are no health information organizations (HIO) and no “collaborative HIE networks” operating in NH today, so no organizational or technical mechanism is in place to help facilitate cross-organizational collaboration or common investment.

Chronological overview of collaborative HIT and HIE activities in New Hampshire 2005-2010

2005

- With funding from foundations, the insurance carriers, and the University of New Hampshire’s New Hampshire Health Information Center, the NH Connects for Health project was launched. Two statewide conferences were held on the topic of health information exchange, more than 30 key stakeholder interviews were conducted, and a provider technology survey was completed
- New Hampshire was one of 34 states (initially – more added later) to receive funding for the Health Information Security and Privacy Collaboration (HISPC). The first phase of this project was completed in May 2007, examining the legal and process barriers to health information exchange. The final phase concluded in 2009, comparing a set of use cases across 11 states, including NH.

2006

- New Hampshire’s ePrescribing program was launched in October 2006 and one year later had active partnerships with Anthem, the Local Government Center, and key provider constituents.

2007

- A statewide health information technology and exchange working group was convened in May 2007 and developed a vision statement and a set of principles (separate document), ratified in September 2007, to be used when stakeholders are considering health information technology investments. This was provided to Governor Lynch in October 2007.
- A research effort in the North Country to conduct a needs analysis for health information exchange and to determine the financial viability of a North Country regional health exchange effort was performed. It demonstrated the high level of point-to-point interfaces developed alongside “view access” into various clinical systems across provider systems.

- The New Hampshire Comprehensive Health Information System (NHCHIS) web reporting tool launched in the summer and with plans to expand to 100 standard reports in the next year (www.nhchis.org). The system resides upon the Comprehensive Health Information System (CHIS), one of the first All-Payer Claims Databases (APCDs) in the country.
- The Regional All Payer Healthcare Information Council (RAPHIC) was developed and initially consisted of all Northern New England states to develop consistency between each state’s all payer claims database (APCD) for research purposes and healthcare transparency efforts. It now has representation from more than two dozen states, co-hosts an annual conference, and promotes APCDs in other states.

2008

- In May 2008, the Governor created an Executive Order, asking the NH Citizens Health Initiative to develop a New Hampshire strategic plan for health information technology and exchange. This plan was released in January 2009.

2009

- Fall 2009 – NH notified \$5.5M would be provided for HIE planning and implementation activities under the HITECH State HIE Planning and Implementation Cooperative Agreement Program. NH DHHS held an HIE Planning and Implementation Project kick off meeting for all potential stakeholders held to provide overview of the project.
- Winter 2009 – Discussions began, hosted by NESCSO, between the New England states regarding how resources for health information exchange (HIE) could be shared. Current focus is a discussion regarding regional architecture as well as regional master provider index. Both concepts are exploratory. The plan is to continue to develop partnerships with Maine, Vermont, and Massachusetts given that New Hampshire is geographically bordered by these three states and they currently have active health information exchange initiatives in various stages of development.

2010

- Late spring 2010 – NH Medicaid submitted to CMS the planning application document to enable the state to receive funding to develop the State Health Information Technology (HIT) Plan. Beginning summer 2010 NH Medicaid will develop State HIT Plan to enable the provider incentive payment program for adoption and meaningful use of certified EHRs.
- May 2010 – New Hampshire Hospital Association convenes hospitals and other stakeholders to discuss state-level HIE vision, principles, services, value, and strategies. Draft consensus document created of prioritized use cases.
- June 2010 – NH DHHS held an HIE kick-off meeting for all stakeholders involved in the summer 2010 planning effort.

Table 22: Gaps in HIE Capability

#	Current Gap	Recommendation
17	No “collaborative HIE networks” or organizations operating in NH	Build an organizational and technical foundation for achievement of longer term statewide health information goals

Summary of current gaps and recommendations mapped to recommended strategies

Table 23: Summary of Gaps in HIE Capability

#	Current Gap	Recommendation
Health information technology adoption		
1	A substantial fraction (43%) of ambulatory providers do not have EHRs	Help coordinate the efforts of programs focused on HIT adoption within the State (e.g., Regional Extension Center program, Medicaid planning, private health plan incentive programs)
2	A substantial fraction (34%) of ambulatory clinicians are not part of existing hospital HIE activities and planning	Devise policy and/or technology approaches to facilitate creation of new networks or expansion of existing networks to include independent ambulatory practices and other ambulatory entities
Patient care summary exchange		
3	There is considerable summary care exchange activity within hospital networks in the state today, but relatively little of it is MU-compliant and the majority is focused on unidirectional information from the hospital to ambulatory providers	Support exchange of electronic patient health information for purposes of care coordination among organizations and healthcare stakeholders
4	There is almost no MU-compliant summary care exchange capability among ambulatory providers, from ambulatory settings back to hospitals, or across hospital networks	Give high priority to developing solutions for MU-compliant summary care exchange in these gap areas. Develop an approach to address summary care exchange needs of independent practices outside of hospital networks, and exchange capacity across hospital networks.
5	There is a high degree of heterogeneity across hospital networks in the level and types of HIE activities being supported, as well as in their readiness for MU.	Conduct detailed assessment of MU-readiness of each network, and develop program to facilitate achievement of HIE core capability across all hospital networks
ePrescribing		
6	88% of Providers are not e-Prescribing and 4% of community pharmacies are not set up for e-prescribing	Encourage eRX adoption through outreach and education in coordination with MU incentives and prospective REC. No need to create infrastructure, adequate e-prescribing capabilities are commercially available
7	Patient coverage for benefit/history information is relatively low (66%)	Identify drivers of low patient coverage and develop program to expand coverage.
Lab results delivery		
8	25% of clinical laboratories do not have capability to send outpatient lab results via an EHR interface	Encourage development of lab EHR interfacing capabilities through outreach, education, and policy guidance
9	Over 80% of lab hospital labs do not use EHR interfaces as the primary means of lab results delivery to ambulatory practices.	Encourage labs to shift delivery of results to EHR interface channel through outreach, education, and policy guidance

Electronic claims submission and eligibility-checking		
10	Although the dominant payers are capable of supporting electronic claims submission and eligibility checking, a portion of providers (~20% of hospital system owned/affiliated providers) are not using this capability.	Encourage adoption through outreach and education in coordination with MU incentives and prospective REC – No need to create infrastructure, adequate capabilities are commercially available
Public health reporting		
11	Current state law prohibits an HIE entity from conducting public health information exchange with PHI	Support expansion of current law to allow an HIE entity to conduct public health transactions that are required by law and/or by meaningful use
12	No electronic immunization information is delivered from providers or hospitals to public health	*Support secure and private exchange of electronic immunization information to public health departments – this would allow the state to meet its immunization registry obligations under RSA 141-C:20
13	No electronic notifiable lab results are delivered from community labs to public health	*Support secure and private exchange of electronic notifiable lab results to public health departments
14	Limited electronic information flows to the city public health departments	*Support secure and private exchange of electronic immunization information, notifiable lab results, and syndromic surveillance information to city public health departments as appropriate
15	<p>Current public health reporting systems are burdensome, inefficient, and rely upon transmission channels that are difficult to secure:</p> <ul style="list-style-type: none"> ▪ Hospitals, providers, and labs are required to report several types of information to public health through multiple disparate systems ▪ Data submission is often conducted through mail, fax, phone, and email transmission channels – public health has had to compensate for the security level of these channels by instituting policies and procedures to ensure the privacy and security of personal health information ▪ The State uses manual data entry processes for majority of information capture and reporting ▪ Multiple systems are required by law to use identified personal health information 	*Improve privacy, security, and efficiency, governance, and technical integrity of mandatory public health reporting – consider system consolidation and sunset transmission options that are less secure than new channels
Patient access to health information		
16	The majority of practices do not provide patients with electronic access to their health information.	*Support secure and private exchange of health information with patients
Capacity to support collaborative statewide HIT/HIE activities		

17	No “collaborative HIE networks” or organizations operating in NH	Build an organizational and technical foundation for achievement of longer term statewide health information goals
*Note: Not allowed to be conducted through an HIE entity according to current NH law.		

SP-2, SP-3 HIE and HIT Development and Adoption Summary

Vision for Health Information Technology and Exchange in New Hampshire

The vision for health information technology and exchange in New Hampshire that forms the basis of this strategic and operational plan draws from two cornerstone statewide efforts.

On December 12, 2009 the New Hampshire Hospital Association adopted the following HIT and HIE Vision:

The vision is for a national system of exchangeable health information to improve health patient care, develop health policy, improve public health, and to base hospital and physician payment for services on value and quality. A national system is an important long term goal but it should not slow down the current deployment of local HIE.

Two years prior, on September 6, 2007, the NH Citizens Health Initiative ratified a vision for New Hampshire Health Care Information Technology and Exchange in 2014. This vision was developed through a multi-stakeholder collaborative process which achieved consensus on the principals for HIT and HIE in New Hampshire.

For Health Information Technology (HIT) and Health Information Exchange (HIE) to be successful in New Hampshire, there is a need to recognize the interrelationships and importance of patient privacy, patient safety, and public health. The NH Citizens Health Initiative holds the following vision for health care information technology and exchange for 2014:

Private and Secure. A patient's personal health information will be secure, private, and accessed only with patient consent or as otherwise authorized or required by law.

Promotes Quality, Safety, and Efficiency. HIT and HIE will serve as vehicles to promote quality and patient safety, increase efficiencies in health care delivery, and improve public health;

Electronic. All health care providers will use a secure, electronic record for their patients' personal health information;

Accessible. All patients will have access to a secure, electronic, and portable health record;

Equitable. HIT will be a vehicle to support equitable access to health care services.

The strategic and operational plan reflects the core principles of these complementary vision statements. We emphasize that these principles form a vision for what should be accomplished by HIT and HIE together in the state of New Hampshire. While some functions may be deemed most appropriate for HIT, and others for HIE, the goal is to achieve the vision through the complementary combination of HIT and HIE capabilities.

Strategies for Achieving Health Information Exchange Vision

The following strategies define what we propose to do to meet our goals and achieve our vision:

1. Establish a sustainable organizational, governance, and technical foundation for achievement of long term statewide health information goals
2. Level-set individual providers' abilities to meet stage 1 meaningful use criteria by facilitating ePrescribing, lab results delivery, and patient care summary exchange across the state
3. Catalyze the efforts of programs focused on HIT adoption
4. Expand availability of HIE services to providers that do not currently have access to robust capabilities for health information exchange
5. Collaborate with Legislators to define the future policy governing HIE purpose and participants

Strategy 1 – Establish a sustainable organizational, governance, and technical foundation for achievement of long term statewide health information goals

As identified in the environmental scan, there is currently no organization, governance, or technical foundation in place to help facilitate inter organizational health information exchange. In response, our strategy is to design and launch a self-sustaining Health Information Organization (HIO) and corresponding governance body to help facilitate achievement of long term statewide health information goals. We will also create a technical foundation for secure messaging that can provide value on its own and that is extensible for broader and deeper future functions.

Strategy 2 - Level-set individual providers' abilities to meet stage 1 meaningful use criteria by facilitating ePrescribing, lab results delivery, and patient care summary exchange across the state

As identified in the environmental scan, there are gaps in e-prescribing, lab results delivery, and care summary exchange. In response, our strategy is to facilitate exchange of key health information. This strategy will be accomplished through education, outreach, and coordination activities where viable technology options are in place, either within "HIE clusters" or in the private marketplace. Where there are no technology options in place, we will work to bridge existing HIE clusters by deploying a Health Information Exchange.

Strategy 3 – Catalyze the efforts of programs focused on HIT adoption

Health information exchange is reliant upon providers adopting and properly using electronic health records. To address this challenge we will help coordinate the efforts of programs focused on HIT adoption within the State including Medicaid and the prospective Regional Extension Center among others.

Strategy 4 – Expand availability of HIE services to providers that do not currently have access to robust capabilities for health information exchange

Roughly 34% of the State's providers are not affiliated with the hospital systems and are in need of a means to access robust capabilities for health information exchange. We will assist these providers to join an existing, or form a new, HIE cluster in order to access adequate health information capabilities.

Strategy 5 – Collaborate with Legislators and Stakeholders to define the future policy governing HIE purpose and participants, and the value propositions to ensure ongoing private sector participation

Current law places restrictions on the types of transactions that can be conducted by a collaborative HIE entity. Transactions through an HIE entity are only allowed for information sharing among providers for treatment purposes. This law currently prohibits many information transactions that have been identified

by stakeholder representatives as having high value. Stakeholder representatives have reached consensus on the desire to work with Legislators to continue to define the future policy that governs health information exchange. In particular, stakeholder representatives would like to explore use of the HIO and its technical infrastructure for the following purposes:

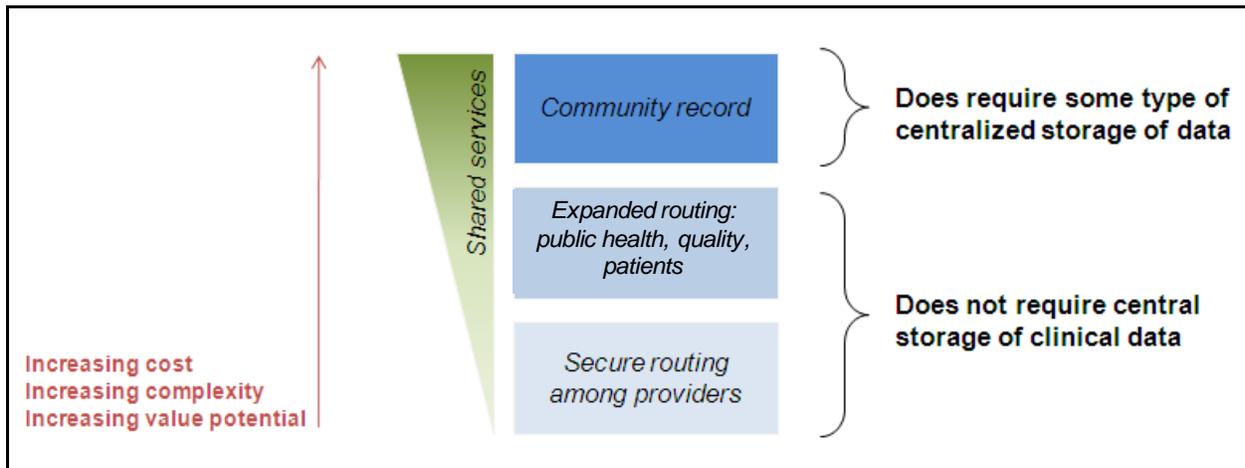
- Public Health Reporting - Public health reporting is statutorily required, however, the current law does not allow such transactions to be brokered by an HIE entity in New Hampshire. There is an opportunity to streamline the public health reporting burden placed upon providers by the current public health reporting systems (35 separate systems in use) by utilizing statewide HIE services for public health transactions. This provides an opportunity to reduce the non-secure, non-private transmission channels currently in use for public health reporting (e.g., Mail, fax, phone) while introducing multi-stakeholder governance and oversight for personal health information used for public health purposes. Finally, this will help reduce the multiple ad hoc point-to-point electronic and non-electronic solutions in place between providers and public health and encourage capacity building of public health systems to accept electronic reporting of immunizations, notifiable diseases and syndromic surveillance information from providers.
- Meaningful Use Reporting to Medicaid & Medicare/ Quality Reporting – Beginning in 2012, providers and hospitals will be required to report meaningful use indicators to the Centers of Medicare and Medicaid Services (CMS) to qualify for and receive incentive payments. Current law prohibits sharing of information with CMS via the statewide HIE service. There is an opportunity to efficiently provide a shared service to providers via the HIO for meaningful use reporting. Many hospitals and providers participate in quality improvement initiatives with private payers including variations on “Pay for Performance” and Pay for Outcomes” incentive programs. There is an additional opportunity to efficiently provide a shared service for quality reporting via the HIO.
- Patient engagement – Although patients own their own health information, current law prohibits patient participation in the HIE entity to access such information electronically. This means patients must request copies of records from multiple sources and in multiple formats (e.g., electronic, paper) placing a significant administrative burden on patients and providers upon each request. There is an opportunity to facilitate private and secure hospital-to-patient, provider-to-patient, and lab-to-patient information transactions. The use of an HIO to facilitate such information sharing opens opportunities for patients to use personal health records and associated self-management tools which provide critical information feedback for patient engagement in wellness and healthcare decisions. (Note: we have not reached consensus on whether patients should be direct customers of the HIO or if they will be better served by a primary care provider that is supported by the HIO. This will be determined in future planning efforts.)

The immediate priority will be to pursue expansion of the current law to allow public health reporting that is already required by statute and regulation, and quality reporting that will be required by CMS.

Overall HIE infrastructure and services framework

The SOP development process began with a framework to “cast the net widely” to create a comprehensive list of *possible* services and functions that a statewide HIE approach could fulfill. This process generated 52 reference use cases that were introduced in the environmental scan. These use cases were bundled into HIE “building blocks” that represent policy, legal, technical, financial, and business arrangements needed to create the capabilities required to accomplish the use cases in each building block; each building block essentially represents groupings of use cases that have similar levels of complexity along these dimensions. These building blocks are described below.

Figure 9: HIE Building Blocks



It is important to note that this building block approach is simply a way to organize and analyze the full spectrum of possible functions and uses of statewide HIE services. The framework DOES NOT represent the agreed upon roadmap for the state – it is simply a heuristic model to facilitate discussion of preferences and priorities according to understandable criteria. The benefit of this approach is that it provides a basis for rigorous consideration of the value-complexity trade-offs associated with each HIE transaction, while also ensuring that incremental investments made today provide options for growth in the future if desired. We discuss later the decisions that have been agreed to for the SOP.

Secure Routing among providers

The first building block, secure routing among providers, is a capability that will enable a provider to push information to a hospital, lab, or other provider through a secure channel. This building block will allow no delivery to non-provider entities (e.g., public health, patients, quality data warehouse), no clinical data held or accessed by the intermediary HIO, and delivery of secure messages will only be to trusted and interfaced systems, meaning there will be no look up or browsing of records. Secure routing requires that receiving entities develop the capabilities necessary to integrate the "pushed" information into their unique systems and processes.

This creates quite a bit of value over current practices in use. Secure routing mimics the processes that occur today via fax, paper, and telephone, yet it is much more secure and private, timely, and efficient. This foundation will help hospitals and providers meet stage 1 meaningful use criteria so they may qualify for incentives from CMS and State Medicaid. An easy to use secure routing platform will encourage transmission of discharge summaries, patient referrals, and lab results where they do not occur today, with potential to greatly improve quality, safety, and coordination of care and provide a universally available platform for all providers in the state to fulfill stage 1 interoperability requirements. Since structured data elements can be routed securely, this capability enables organizations to efficiently consume data elements in their health record systems.

Expanded secure routing: public health, quality, and patients

Once the HIO is established and is generating valuable services, the higher complexity building blocks may be considered. One of these options is the expansion of secure routing to public health and patients. While expanding secure routing to public health agencies and/or quality data warehouses does not increase technical complexity appreciably, it does represent a significant step up in legal and policy

complexity because such transactions are legally prohibited today. If Legislators decide that there is value in expanding use of the secure routing platform for other functions such as public health, quality reporting, and/or patient portals, exchange may be facilitated with patients, NH Medicaid, and/or public health among others.

With the addition of new stakeholder participants, there will still be no clinical data accessed or held by the HIO. Healthcare stakeholders will be able to push information to public health or Medicaid and visa versa. Examples of information that may be shared include immunization reports, reportable lab results, syndromic surveillance information, and Medicare/Medicaid meaningful use quality measure reports.

The addition of public health brings a great deal of value. Provider reporting burden may be greatly reduced. Required information including immunization, syndromic surveillance, and reportable conditions information may be securely and efficiently gathered among other benefits.

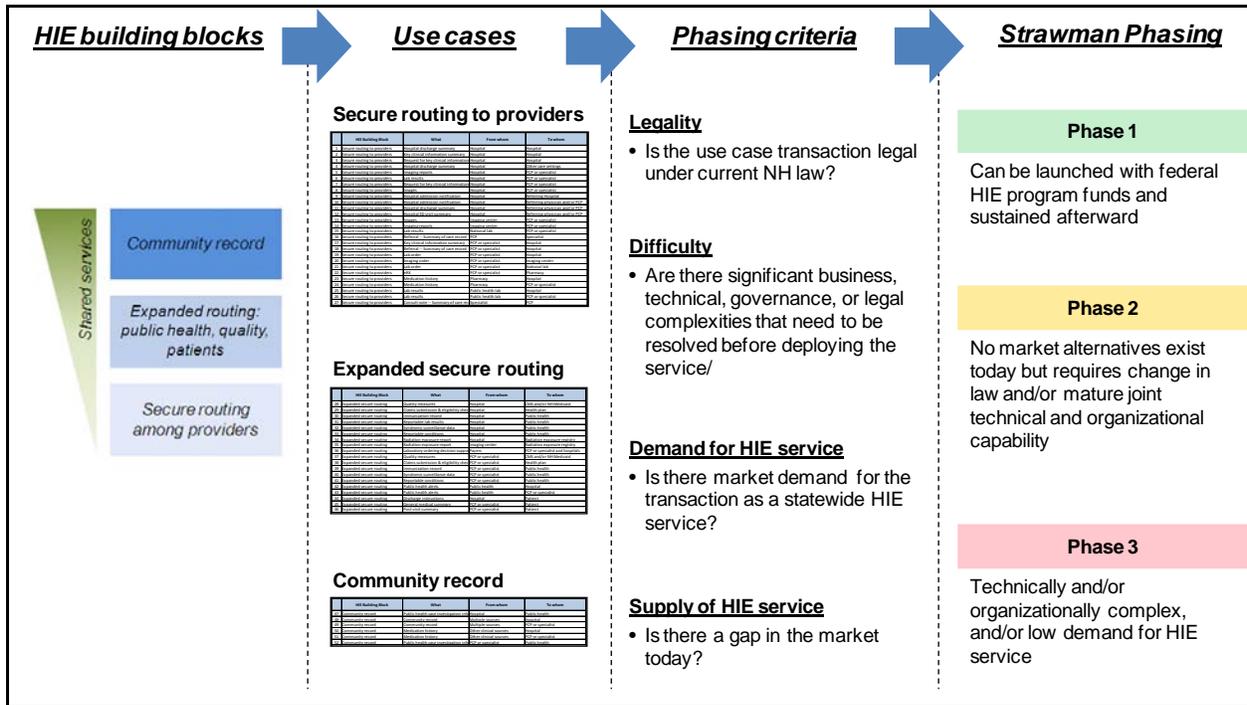
The addition of patients does bring technical and policy complexity because it requires the HIO to match patient records across organizations, and authenticate patient users, even though there will still be no clinical data accessed or held by the HIO. Healthcare stakeholders will be able to push information to personal health records (PHRs) and conceivably, patients will be able to push information to providers. Examples of information that may be shared with patients include medical summaries, visit summaries, discharge instructions, lab results, and patient reminders among others.

Community Record

The most complex building block for consideration is the community record, which represents the matching and merging of patient records across provider organizations and making such records available to clinical users on demand. While the degree of record merging may vary, and regardless of whether the data is held centrally or in a federated architecture, the centralized orchestration of matching and merging of records and the ability of users to query the system for historical patient information represents a significant step up in legal, technical, and organizational complexity.

Each of these building blocks represents steps up in terms of potential value as well as in terms of cost and complexity. A plan or roadmap represents an articulation of decisions that have been made based on a weighing of the benefits against the costs and risks. Our consensus process considered these building blocks and the underlying use cases according to four key criteria which allowed prioritization in terms of phases, as depicted below.

Figure 10: Prioritization and Phasing Framework

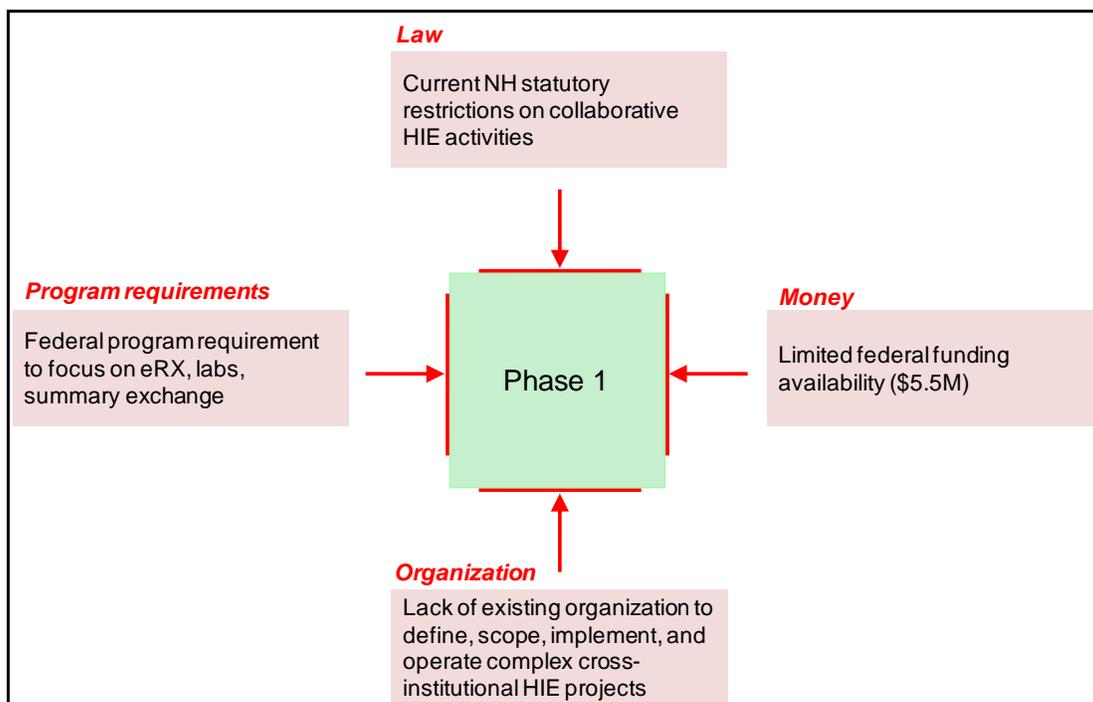


The workgroups assessed the building blocks and use cases according to four key criteria: Legality, Difficulty (business, technical, governance, legal), Demand, and Supply. The Operational Plan describes this prioritization and ranking process in greater detail.

Constraints

We have taken a highly pragmatic approach to enabling improved exchange of health information in New Hampshire. The central tenet of the project is to identify the gaps that exist across the state today and close such gaps through orchestration of communication, outreach, and policy guidance to build upon and align current and planned capabilities, and only where necessary and desired, create shared service organization and infrastructure to lower the cost and/or increase the effectiveness of HIE deployment across the state. As noted in the environmental scan, there are many capabilities in place that may be leveraged. There are also significant gaps. For planning purposes the workgroups that developed the plan identified the constraints that bound our options and proposed an HIE design that will work within these constraints.

Figure 11: Constraints that bound the HIEPI Project



Constraint 1 – NH Law

New Hampshire has developed a policy framework that limits the people that can use a HIE entity and the purposes for which they may use it. There is also State law defining patient ownership of health information and a patient’s choice to “Opt Out” of the HIE entity. This legal framework permits use of the HIE entity only for Providers for the purposes of treatment, limiting exchange among other stakeholders (e.g., Patient, public health, quality reporting organization) for all other purposes (e.g., Patient self-management, immunization reporting, meaningful use reporting to CMS). This legal framework is described in detail in section SP-8.5.

Constraint 2 – Money

The \$5.5 M investment by the Federal government will provide “seed” capital for the launch of an organization and creation of some technical infrastructure, but this initial investment will not go very far toward creating the type of value that is possible with robust exchange of health information. Therefore, workgroups have focused on creating an organization and technical infrastructure that can provide a valuable foundation that may both stand on its own (if further revenue is not accessed), and can be extensible (if additional revenue is accessed).

Constraint 3 – Organization

Many States have multi-stakeholder health information organizations and shared HIE technology infrastructure to build upon. New Hampshire has neither, requiring that the State establish organizational and governance fabric for collaboration among multiple disparate organizations as well as a basic common technology foundation for exchange of health information among these disparate organizations.

Constraint 4 – Program requirements

The HIEPI project is a collaborative agreement between ONC and NH DHHS. ONC requires that this project focus on providing at least one option for eligible providers to meet stage 1 meaningful use criteria with initial focus on provider and hospital exchange of electronic prescriptions, electronic lab results, and electronic summary exchange.

Introduction to the detailed approach sections

The remaining sections of the Strategic Plan provide the details for our recommended approach to launching an HIO and immediately establishing a core technical infrastructure for secure routing of health information among providers. Each section of the plan fulfills a set of planning requirements set forth by ONC. These are covered both to ensure that the plan is thoughtful and complete, and to be compliant with the ONC guidelines so New Hampshire may access the remainder of the federal funds for this project.

The following sections detail opportunities for collaboration among the many stakeholders and organizations that are undertaking HIT and HIE projects in the State. Our intention is to ensure collaboration among leaders, coordination of projects, sharing of resources, and avoidance of waste and duplication. These points of coordination include:

- NH Medicaid
- Medicare and Federally Funded, State Based Programs
- Federal Care Delivery Organizations
- Other ARRA Programs Summary
- Public Health Programs

After the coordination sections, the plan covers 5 detailed planning domains:

- Governance – provides recommendation regarding the organizational form the HIO may take and how this entity may be best governed
- Sustainability – provides recommendations on the HIO revenue model and how the HIO may sustain itself once one-time federal funds are no longer present
- Architecture and Standards – provides a recommended technical infrastructure
- Services and Operations – provides recommendations regarding the services the HIO should provide and how the HIO will be managed and operated once in place
- Privacy and Security – provides explanation of the current legal framework for health information exchange, privacy, and security in the State and makes recommendations for future development of this framework

SP-4 Coordination with Medicaid

The New Hampshire Medicaid program has many interests in common with the HIEPI project and leaders from both projects are working closely together to meet common objectives. Coordination of the programs is facilitated by the fact that both are operated by the NH DHHS under common leadership. Medicaid has a seat on the Steering Committee that oversees the HIEPI project and provides stakeholder representation in the planning process. Conversely, the State HIT Coordinator is on Medicaid HIT Project Steering Committee. HIEPI and Medicaid leaders meet weekly to ensure the programs are working in tandem. Finally, the Medicaid health IT project is sharing environmental scan resources and information with the HIEPI project through shared resources at the University of New Hampshire.

Potential intersection points between Medicaid and HIE

Medicaid provides for healthcare coverage of 123,000 residents, or 9% of New Hampshire's resident population or 7% when excluding those who have both Medicare and Medicaid. Therefore, Medicaid is an important stakeholder in the HIEPI planning initiative. Medicaid is also accountable for creating its own health IT plan, opening an opportunity for close collaboration and pooling of resources to meet shared interests.

Medicaid leaders have initially identified 4 priority areas where improved exchange of health information can benefit Medicaid beneficiaries and the delivery of the program itself:

- Patient Centered Coordination of Care
- Clinical Quality Reporting
- Payment Reform
- Fraud & Abuse Detection and Prevention

As mentioned earlier and will be described in greater detail later, Medicaid is currently prohibited under state law from using a statewide HIE entity to transact electronic exchanges involving patient-identified information. We provide below additional description of potential opportunity areas with Medicaid. Should the law be expanded to allow Medicaid to fully participate in the future, we will update the SOP to include integration of Medicaid use cases in the overall strategy.

Patient Centered Coordination of Care

Though Medicaid patients share the same care provider networks as those covered by private health insurance, a large portion of the Medicaid population does not have a mechanism in place to facilitate coordination of care. Unlike commercial healthcare members, that are encouraged through plan design and co-pay structures, to seek care from a primary care provider and then use a referral mechanism to escalate care to specialists and hospitals, Medicaid has no such mechanism. This creates a care coordination problem and encourages overuse or inappropriate use of healthcare services. Cross-organizational health information can facilitate coordination of care for the Medicaid population.

Clinical Quality Reporting

Efficient clinical quality reporting can be facilitated by HIE and offers three main benefits to Medicaid. First, Medicaid can better understand the overall health of the Medicaid population and subsequently identify and execute changes to the Medicaid program that may improve the health of this population. Second, Medicaid can better understand the quality of care delivered by the Providers serving the Medicaid population and may take steps to reward exceptional caregivers and take action with providers that are delivering care that is of poor quality. Third, HIE may help facilitate reporting for the new Medicaid meaningful use program.

Payment Reform

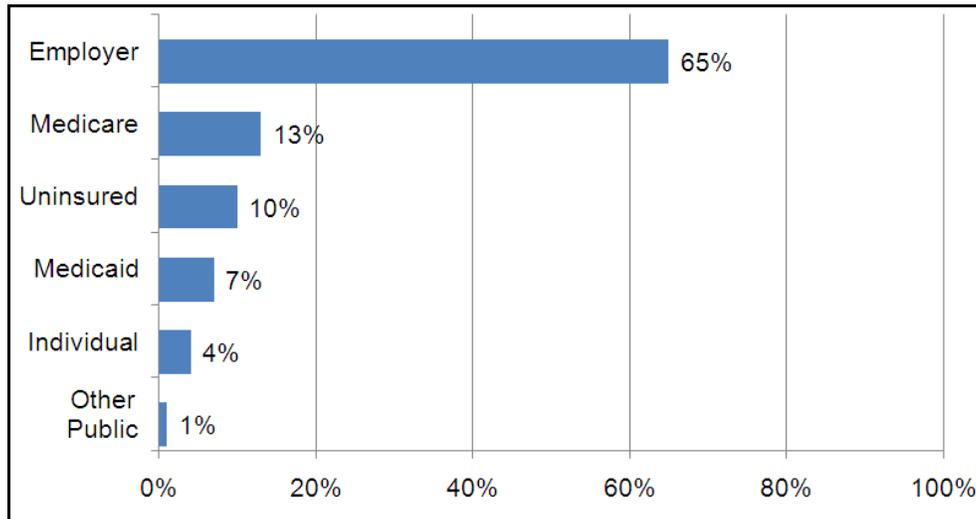
New Hampshire Medicaid will be responsible for executing many of the reforms that went into law this year via the Affordable Care Act of 2010. This law is focused on accountability of payers, lowering health care costs, and enhancing the quality of health care for all Americans. The New Hampshire Department of Health and Humans Services is responsible for initiating many of these healthcare reforms at the State level.

HIE can play a major role in health reform efforts by making available key healthcare quality information which may enable Medicaid to pay Providers differently. This information is foundational for any payment reform efforts that hope to accomplish dual goals for quality improvement and cost saving.

Fraud & Abuse Surveillance, Detection and Prevention

Medicaid currently relies upon claims data and manual audits of patient charts to detect fraudulent and illegal Medicaid claims. Reduction of Fraud translates directly into cost savings and exchange of electronic patient information can facilitate fraud detection.

Figure 12: NH Lives Covered by Coverage Type



Source: University of New Hampshire Regional Data Scan (2010)

Unlike neighboring States where Medicaid represents a significant portion of the population (Maine – 20%, Massachusetts - 17%, Vermont - 19%), and therefore a significant portion of a provider or hospitals business, New Hampshire Medicaid only covers 7% of the State’s population. Therefore, even with ARRA meaningful use incentives in place, Medicaid will need to work in collaboration with other payers and partners to encourage changes in healthcare delivery and payment.

Approach to Future Planning for HIE Requirements of Medicaid Meaningful Use

Medicaid is currently heavily involved in the HIEPI project and will continue to be involved through the following activities:

1. Medicaid will be involved in the design of the HIO governance
2. Medicaid leaders will continue to coordinate efforts between the HIEPI project and Medicaid including provider outreach and communications activities

3. The Medicaid program will build upon the initial list above to identify common priorities between the HIEPI project and Medicaid
4. Medicaid and HIEPI leaders will collaborate with other HITECH programs operating in the State, including the newly-proposed Beacon Community and Regional Extension Center applicants and the newly awarded workforce development projects in the region
5. HIEPI, Medicaid, and REC projects are all aligned around meaningful use and will work collaboratively to ensure New Hampshire's providers can meet meaningful use requirements and access incentive payments
6. HIEPI and Medicaid are conducting joint needs assessments and environmental scans as well as shared assessments of privacy policies at the state and Medicaid program levels
7. HIEPI will build upon existing Medicaid IT infrastructure where appropriate including the New Heights eligibility checking and claims submission applications and the Medicaid Management Information claims processing system.
8. HIEPI and the REC program will both work with Medicaid to promote the available incentives designed to encourage provider participation in the health information exchange

SP-5.1 Coordination with Medicare and Federally Funded, State Based Programs

Coordination with Medicare

We understand that the HIEPI project is intended to work in synchrony with Medicare and with the delivery of the Medicare meaningful use incentives in particular. Whereas the Medicare incentives provide the motivation for hospitals and providers to adopt and meaningfully use health information technology, the State's HIE strategy provides a path to achieve those means and to clear the large obstacles to exchange of electronic health information.

Stakeholders in New Hampshire will continue to work closely with regional Medicare leaders. The project has aligned with the final rules released in July 2010 and will continue to re-align as these rules evolve. We recognize that the final rules that define meaningful use criteria and certification are mechanisms to help organizations stay aligned with other organizations and to help states stay aligned with other states. We intend to synchronize our efforts with this guidance so our hospitals and providers may eventually conduct all information transactions in a secure, private, standards-based, efficient, patient-centered manner across both organizational and state boundaries.

Coordination with the Centers for Disease Control and Prevention (CDC)

The state HIT Coordinator has identified a number of federally funded state-based programs and will be holding a meeting at the project management level to identify and understand interdependencies, integration and areas of collaboration. We will continue to identify points of collaboration into the fall and have identified the following with a solid intent to collaborate:

CDC Public Health Emergency Preparedness (PHEP) is a base preparedness grant. Currently structured priority projects include NEDSS, CRA, HCS, AHEDD ELR initiatives, HAN messages and PHIN certification. CRA/HCS are patient tracking during event. Other systems used routinely for infectious disease surveillance. LIMS - PHL information system recently purchased implemented later in 2011.

CDC Public Health Emergency Response (PHER) H1N1 is a one-time funding grant that ends July 31, 2010. Funds applied to building tools/resources to respond to pandemic. This initiative includes a web based school surveillance reporting tool.

CDC Public Health Emergency Preparedness (PHEP) Inventory management grant is for the purchase of inventory management software to manage the statewide cache of supplies that may be needed in emergency response. This initiative also includes program work around sustaining capacity to have shelters in an emergency response.

Coordination with the Assistant Secretary for Planning and Evaluation (ASPE)

- There are currently no ASPE programs identified for coordination

Coordination with the Health Resources and Services Administration (HRSA)

The state HIT Coordinator has identified a number of federally funded state-based programs and will be holding a meeting at the project management level to identify and understand interdependencies, integration and areas of collaboration. We will continue to identify points of collaboration into the fall and have identified the following with a solid intent to collaborate:

The Maternal and Child Health State Systems Development Initiative works to create a health data mart that is intended to bring together data sets into a new tool to provide report data on the linkages between infant birth and death records, newborn screening program records, and long-term birth certificate, fetal death and MCHS prenatal program files.

Emergency Medical Services for Children Program is part of a project which aims to the level of pediatric emergency care. EMSC's approach is broad based and considers the full continuum of issues ranging from injury prevention to improved rehabilitation outcome for pediatric emergencies with audiences ranging from EMTs and pediatricians, to families and day care providers etc. This builds upon over 20 years of efforts by the Department to train Fast Squads (EMTs) throughout New Hampshire and Vermont.

The New Hampshire State Offices of Rural Health Policy (SORH) is a component of the Rural Health and Primary Care Section within the Division Public Health Services. The mission of the RHPCS is to be the resource to communities and stakeholders that support innovative and effective access to quality healthcare services, with a focus on low income, uninsured and Medicaid populations of New Hampshire. This mission aligns well with the five SORH Core and additional functions of collecting and disseminating information to rural health stakeholders. The HIT Coordinator will reach out and meet with the SORH program administrator to understand areas of programmatic coordination and to understand the level of interest in the exchange of health information.

Coordination with Substance Abuse and Mental Health Services Administration (SAMHSA)

As part of the Department of Health and Human Services, the state of New Hampshire participates in the State Mental Health Data Infrastructure Grants for Quality Improvement program. This program builds on the results of the CMHS Client Level Data Pilot project initiated in FY2008, which enables the collection and reporting of client level data for five Mental Health Block Grant National Outcome Measures (NOMs) through the Uniform Reporting System (URS) over the next three years (Phoenix system). The HIO will reach out and to understand areas of collaboration while working within current New Hampshire law as it pertains to collaborative HIE activities.

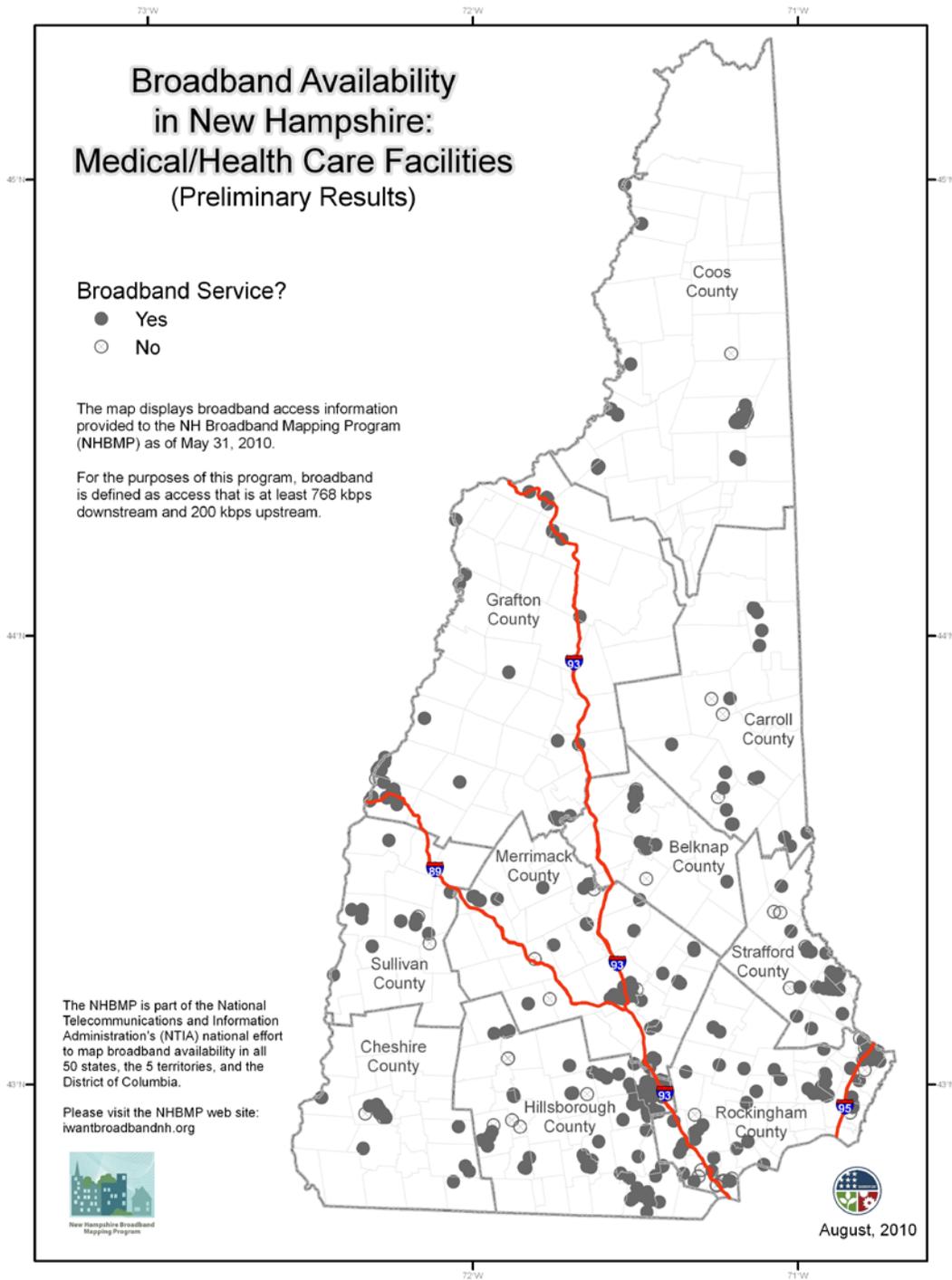
Coordination with Broadband Initiative

The New Hampshire Broadband Mapping Program (NHBMP) is a coordinated, multi-agency initiative to inventory and map current and planned broadband coverage available to the state's businesses, educators, and citizens. The program, funded by the American Recovery and Reinvestment Act through the National Telecommunications and Information Administration (NTIA), is part of a national effort to expand broadband access and adoption through improved data collection and broadband planning. It is being managed by the University of New Hampshire's GRANIT (Geographically Referenced Analysis and Information Transfer) System, which is housed at the Complex Systems Research Center and serves as the NH statewide GIS clearinghouse. New Hampshire's nine Regional Planning Commissions (RPCs) will collaborate with GRANIT on data collection and verification activities, as well as conduct regional broadband planning activities. The project partners will work in close cooperation with the Director of Broadband Technology at the NH Department of Resources and Economic Development. Additional support will be provided by a variety of state agencies, including the Office of Energy and Planning, and the Public Utilities Commission.

The project comprises two components: a two-year broadband availability inventory and mapping effort, and a five-year planning initiative. The inventory will rely on service area data collected from the 60-plus public and commercial entities, both landline and wireless (fixed and cellular), that provide broadband services in New Hampshire. This intensive effort will assemble and analyze data on service availability by type and technology from each service provider. Data will also be collected on broadband availability at individual community anchor institutions, including schools, libraries, medical/healthcare locations, public safety offices, and state/county/municipal buildings.

Leaders from the HIEPI project are working closely with the broadband initiative so that the programs may identify and act upon shared interest areas. The programs are already working together to identify providers. The following map identifies broadband coverage for NH healthcare facilities. This data will be updated in the coming months as new information is gathered.

Figure 13: Preliminary map of broadband coverage for NH healthcare facilities



SP-5.2 Participation with Federal Care Delivery Organizations

Coordination with Veteran's Administration (VA)

The Manchester VA Medical Center (VMAC), a division of the VA New England Healthcare System, is dedicated to providing quality, compassionate and accessible care and service to New Hampshire's veterans. VMAC's four community-based clinics together with Concord hospital work together to form a comprehensive care delivery system serving the veteran population. The State HIT Coordinator has met with senior VHA officials to discuss opportunities to facilitate exchange of critical health information exploiting the certain advantages of the VA technical architecture and the potential capabilities emerging from the Strategic and Operational Plans currently in development. The HIO will explore data sharing with the VA and maintain an open line of communication with regularly scheduled meetings with the HIT Coordinator.

Coordination with Department of Defense (DoD)

The HIT Coordinator will reach out to and meet with Naval Health Clinic New England (NHCNE). Naval Branch Health Clinic (NBHC) Portsmouth is an outpatient medical treatment facility that provides primary medical care and coordinates access to other levels of health care services for active duty, retirees and eligible family members and to understand areas of programmatic coordination and the level of interest in the exchange of health information.

Coordination with Indian Health Service (IHS) and State Tribes

Though members of the Abenaki Nation and Pennacook Tribe inhabited New Hampshire prior to the 1600s, most were displaced or assimilated into colonial society. Currently there are no federally-recognized tribes or Indian Health Service facilities within New Hampshire.

SP-6 Coordination with Other ARRA Programs

Coordination with Regional Center Program

Currently there is no Regional Extension Center (REC) program serving New Hampshire. However, the State has endorsed a REC application in response to the most recent ONC REC FOA. The REC program is focused on assisting priority primary care providers (PPCPs) to implement EHRs and qualify for meaningful use. While meaningful use does not require providers to participate in a statewide HIE program in order to receive MU incentive payments, the goal of the HIEPI project is to create a policy and technology infrastructure that makes it easier for physicians and hospitals to meet the interoperability requirements of meaningful use.

As described earlier, one of the biggest gaps in the otherwise highly developed HIE environment in New Hampshire is the approximately 34% of clinicians that are outside of existing hospital networks. Addressing the HIE needs of this group of clinicians will be a significant challenge for the HIEPI project as these clinicians are disproportionately located within smaller practices in the more rural and remote areas of the state and with lower EHR penetration and adoption. Because the REC program will target these physicians for MU achievement, it is a highly complementary activity that will be rapidly integrated into the HIEPI project if it is funded.

Coordination with Workforce Development Program

The Community College system of New Hampshire (CCSNH) is one of the community colleges participating in the Community College Consortia to Educate Health Information Technology Professionals in Health Care Program. This program, as administered by the ONC, is granting ~\$35 M nationwide to establish consortia to help address the growing demand for highly skilled health IT specialists throughout the country. The country-wide goal of this grant is to help train more than 10,500 new health IT professionals annually by 2012.

The HIEPI leadership has begun coordination of activities with the CCSNH leadership in order to identify key workforce needs to support HIT and HIE development going forward. Stakeholders in New Hampshire recognize that the advancements proposed in the State's Strategic and Operational plans will require a qualified workforce to implement. The program will help identify workforce needs and help inform curriculum and programs to address those needs with CCSNH on an ongoing basis.

HIEPI leaders have met with the Chancellor, Vice Chancellor, and key staff to discuss the opportunity for collaboration. The Community College system already has a Medical Information Systems program in place and has indicated that this can provide a platform upon which to build certificate and associate degree programs. Segments of prospective students were identified in the meetings as were prospective internship opportunities with the emerging HIO and Regional Extension Center. Figure 14 provides a mapping of the community college system campuses in New Hampshire.

Figure 14: Community College System of New Hampshire Campuses



Coordination with Beacon Communities

There are currently no ONC awarded Beacon Communities in New Hampshire. There are regional Beacon Community efforts that we are tracking including the Bangor Beacon Community in Maine and the Rhode Island Beacon Community. We recognize that these efforts will generate significant learning for our own health exchange efforts and will continue to track progress of the Beacon Communities.

SP-7 Coordination with Public Health Programs

Introduction

There is currently close collaboration between the HIEPI project and the Public Health agencies in New Hampshire. Public Health representatives are present in the domain workgroups that are drafting the plans and a separate ad-hoc workgroup has been voluntarily formed to encourage collaboration between the State's public health sub-agencies and the City agencies in Manchester and Nashua.

In so far as patient-identified public health reporting is currently precluded by law from being conducted through an HIE entity, detailed strategic planning steps related to public health are not included in the current plan. Instead, the opportunity for inclusion of public health will be described in this section to help inform future policy discussions. As described later, our collaborative working group process has generated very specific recommendations for changes to the existing law that retain the spirit and intent of the law while allowing carefully circumscribed public health reporting that providers are already required to transact by state and/or federal law or will be required to transact in order to qualify for meaningful use incentives. If public health reporting is permitted by future NH law to be facilitated by a statewide HIE approach, public health stakeholders will update the strategic plan accordingly.

Opportunities for public health information flow via the HIO

Certain public health reporting by providers is required by state and federal law and regulations. Reporting has typically been a patchwork of paper-based and electronic processes reflecting the wide array of disparate reporting that falls under the general category of "public health." The Meaningful Use Final Rule and the HIT Standards Final Rule together strongly incent providers to conduct public health reporting electronically according to nationally validated technical and privacy/security standards. Under Stage 1 of the EHR Incentive Program, eligible hospitals and providers will have to meet at least 1 objective for population and public health, and under Stage 2 it is expected that they will have to meet all objectives. These objectives include:

- Submission of electronic data to immunization registries (hospitals and providers)
- Submission of electronic reportable lab results to public health agencies (hospitals only)
- Submission of electronic syndromic surveillance data to public health agencies (hospitals and providers)

As discussed in the Environmental Scan, current public health reporting infrastructure in New Hampshire is largely paper-based and ad hoc, for example:

- No electronic immunization information is delivered from providers or hospitals to public health agencies and there is no immunization registry
- No electronic reportable lab results are delivered from community labs to public health agencies
- Limited electronic syndromic surveillance data flows to the Division of Public Health Services (i.e., Only Emergency Department data from hospitals, no data from ambulatory providers) and a limited subset of information flows to the city public health departments
- Current public health reporting systems are burdensome, inefficient, and introduce some privacy and security risks
 - Hospitals, providers, and labs are required to report several types of information to public health through multiple disparate systems
 - Submission is through non-secure, non-private channels including mail, fax, phone, and email

- The State uses manual data entry processes for majority of information capture and reporting
- Multiple systems do not use de-identified personal health information

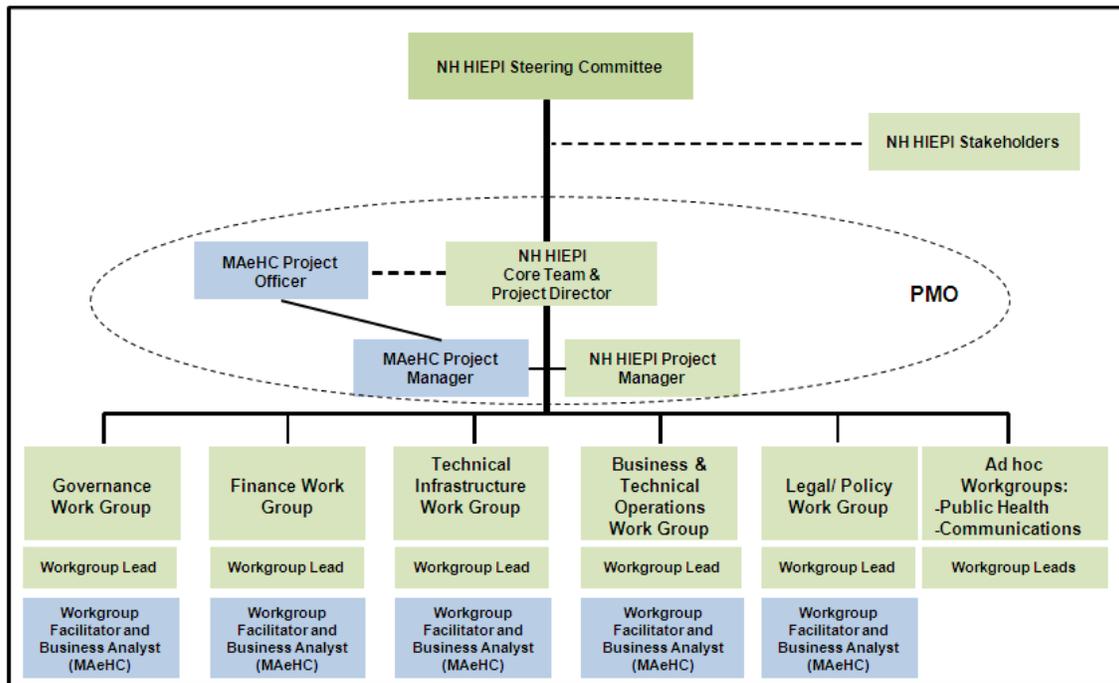
A statewide HIE approach could effectively and efficiently address the gaps identified and facilitate achievement of meaningful use objectives for hospitals and healthcare providers while still adhering to the core principles of the current law to maintain the privacy and security of protected health information. As will be described later, our strategy is to launch an HIE approach that enables secure routing of medical information without exposing or storing any PHI in the HIE entity. This approach would allow providers to utilize the HIO for secure and private delivery of electronic immunization information, notifiable lab results, and syndromic surveillance information to public health, as required by law and meaningful use. Performing these transactions in this way would improve privacy & security protections over current ad hoc practices, and would introduce multi-stakeholder governance to oversee and enforce protection of personal health information. With a secure, private, timely, and efficient transmission channel in place, the State would be in a position to sunset use of less secure information channels, consolidate reporting systems, gain scale and process efficiencies, and realize cost savings. Such an approach would also reduce the cost of public health and MU reporting to providers. As reporting requirements continue to grow, we will see further and more rapid proliferation of redundant paper-based and electronic reporting systems that are more costly and less secure than an approach through a statewide HIE approach.

SP-8.1 Governance

Collaborative Governance Model - Current governance

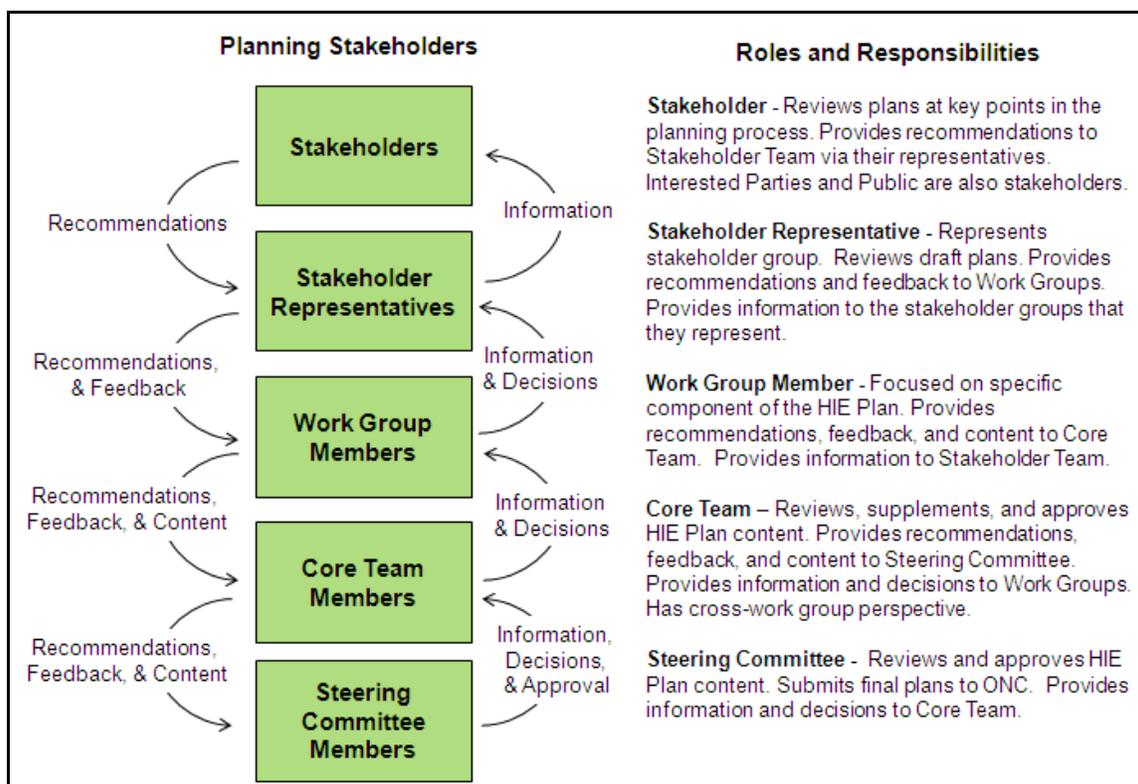
As the contract holder with ONC, NH DHHS currently provides the governance oversight function for the HIEPI project as well as operational leadership and staffing through employees and contract relationships. The collaborative planning is conducted mainly by a broad cross-section of stakeholders who serve in planning workgroups facilitated by professional advisors and supported by a Program Management Office.

Figure 15: Current HIO Governance and Operational Structure



At its inception, the HIEPI project initiated an inclusive and collaborative multi-stakeholder decision making structure and associated processes for the HIE strategic and operational plans. This structure is essentially a representative democracy in which stakeholders voice their opinions through representatives and where a smaller group of representatives do the bulk of the planning in workgroups. A core team provides project leadership support and a steering committee provides oversight and strategic guidance.

Figure 16: Planning Roles and Responsibilities



Collaborative Governance Model - Future governance

Through the planning efforts of the workgroups, a recommendation has been put forth for the creation of a state level health information organization (HIO) that can facilitate cross organizational collaboration and that can implement and manage technical infrastructure. Below is a set of recommendations for the formation of a new HIO.

Source of authority

We recommend that the source of authority for the HIO be defined by state statute. This model has been effective in Rhode Island, Vermont, and Maine through engagement of the State’s elected leadership to define the charge of the HIO. Alternatives are to seek an executive order, to define authority through state contracts, or to leave it to the market to grant the entity authority based upon the value it creates for its participants.

Organizational form

We recommend that the HIO take the form of a “public instrumentality,” which is a public/private organization that is loosely attached to State government. This organizational form will allow us to accomplish many of our objectives:

- **Oversight of public funds:** With a public instrumentality, State government oversight will be in place and the State can work closely with a multi-stakeholder board of directors to provide proper oversight. This level of oversight will help ensure legal, private, and secure exchange of personal health information. Statute may dictate the structure and processes for oversight as well as the level of transparency and accountability required.

- Ability to access both public and private funds: A public instrumentality will have mechanisms in place for allocating Federal and State public funds. In addition, the organization can seek 501(c)(3) not-for-profit status and sustain itself using multiple sources of tax exempt revenue, given that it meets IRS not-for-profit requirements.
- Responsiveness to public and private needs: Although a public instrumentality will have some attachment to the State to be defined by the General Court (e.g., administration of State funds, oversight) the organization can act as an independent entity. This form of organization will allow private stakeholders to participate in governance and management of the organization, which will be key to building an organization that is responsiveness to public and private needs and that can build a sustainable business model through attraction of private funds. The organization also will be required to operate more like a business than a government agency and will need to be designed in a way that allows the organization to be operationally “nimble.”

Creation of a public instrumentality requires legislation and our strategy will be to file this legislation as early as possible in the 2011 legislative session, most likely before the end of calendar year 2010. Forming an HIO that is a public instrumentality, though requiring legislation, strikes an appropriate balance between public oversight and private input and control. A formalized connection to state government is important to provide oversight over federal and state funds and to maintain the state’s interest in key policy areas such as privacy protection. At the same time, we anticipate that this effort will be largely if not completely privately funded over the long-run and thus requires sufficient private sector participation in governance and management to ensure that it can attract private funds.

Contingency plan if General Court does not authorize “public instrumentality” organizational form

We recognize that there is some risk that the General Court will not act expeditiously or as recommended. This presents a risk to the State’s providers’ abilities to meet meaningful use stage 1 and requires a contingency plan that may be implemented quickly. Through our planning efforts we investigated several organizational forms for the HIO (See Figure 17) and our agreed upon alternative to our first choice of the public instrumentality, is the State Agency.

Figure 17: Organizational Form Considerations

Organizational Form	Pros	Cons
State Agency	<ul style="list-style-type: none"> -May provide better means to access state resources in cases where market will not support organization 	<ul style="list-style-type: none"> -Requires statute or state action to launch -May not be viewed as a collaborative public-private organization -Inherits State processes which can limit speed and operational nimbleness -Limited revenue model options -Discouraged by ONC and AHIMA
“Administratively Attached” organization	<ul style="list-style-type: none"> -Can allow pass-through of public funding -Potential access to state resources such as administrative staff, payroll and mail services -Vehicle for cross agency and public-private partnerships -Can be operationally nimble depending on how organization is structured by legislature -May be positioned as a neutral hub for collaborative activity 	<ul style="list-style-type: none"> -Requires statute or state action to launch -It can be difficult to structure a quasi-governmental organization that is perceived as a neutral hub for collaborative activity and that is truly operationally nimble
Public instrumentality	<ul style="list-style-type: none"> -Can allow pass-through of public funding -Can act as a private, not-for-profit company with benefits of operational nimbleness and access to non-public funding sources -Vehicle for public-private partnership 	<ul style="list-style-type: none"> -Similar challenges as “administratively attached” organization -Requires launch of new organization (charter, staffing, infrastructure)
Not-for-profit 501 (c) (3) Charitable org (4) Social welfare org (6) Mutual benefit org	<ul style="list-style-type: none"> -Multi stakeholder -Tax exemption -Works with multiple revenue models -“Nimbleness” -May be easily positioned as a neutral hub for collaborative activity -Sustainable with private funding -Encouraged by ONC & AHIMA 	<ul style="list-style-type: none"> -May require competitive process before Federal \$ may be passed from the State to new entity -Requires launch of new organization (charter, staffing, infrastructure)

Since the cooperative agreement is currently under the management of NH DHHS, this State Agency is best positioned to the HIO quickly if the General Court does not authorize the public instrumentality in the 2011 legislative session (January – May 2011). Though this contingency plan will not require any transition of operations, it will be necessary to broaden governance to include representation from a wide range of stakeholders. This will be accomplished through the creation of a multi-stakeholder advisory committee that works with the current HIEPI Steering Committee to oversee the launch and operations of the HIO within NH DHHS. While that is the contingency plan agreed to through the consensus process at the time, if it appears that the preferred option is at risk we will reconsider all options through our consensus process to take into account any changed circumstances that might bear on our decision.

Structure and membership

We recommend a single governance structure to undertake all governance functions for the HIO. These functions include policy setting, financial oversight and control, and operational oversight. We also recommend that a broad range of stakeholders be represented in the governance structure. The board should be large enough to adequately represent stakeholders and small enough to operate effectively. The recommended principle is “representation by stakeholder group” as opposed to representation by individual or organizational representation.

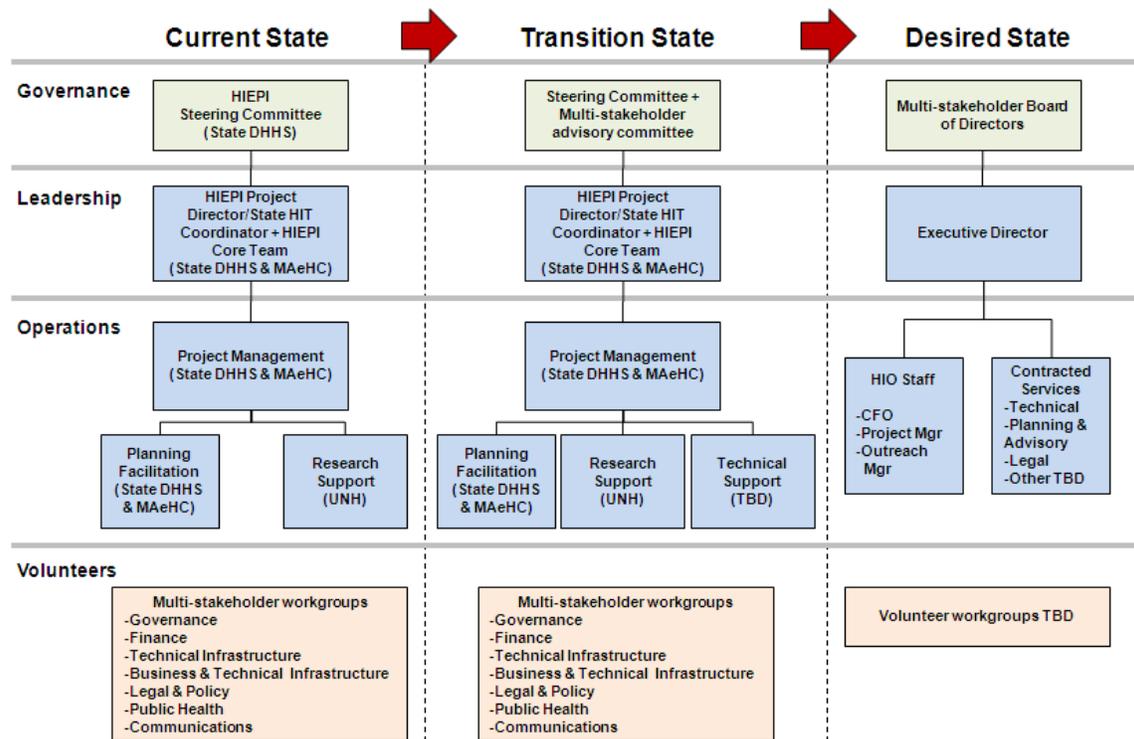
We recognize that if the HIO is successful and creates value, many organizations are likely to begin relying upon the HIO for business critical information transactions. Once organizations place a portion of their business critical functions under the responsibility of the HIO, their need for adequate participation

in oversight will increase to manage this type of risk. Therefore, we will plan for this situation in advance and design the governance structure and membership accordingly.

Transition of governance

NH DHHS is currently playing the role of HIO. Since the HIEPI project is recommending that a new independent organization take on the future governance, planning, launch, and operations phases of the HIEPI project, a transition is required to move from current governance to future state governance. Figure 18 illustrates the anticipated transition of HIO governance, leadership, operations, and volunteers from its current state within the NH DHHS to the future state where operations will be housed in a new organization.

Figure 18: Transition of Governance and Operations to HIO



Accountability and Transparency

The HIEPI project has put a transparent multi-stakeholder process in place for the current HIEPI project activities and intends to continue this process through the interim governance period. The project is currently under the oversight of a NH DHHS Steering Committee and is ultimately accountable to the residents of New Hampshire.

Structures and processes for accountability and transparency management for the future HIO will be defined by the General Court. Once defined, policies and procedures, including 91A compliance, will be put in place including goal setting, regular reporting, and frequent communication with stakeholders.

Facilitating Participation in NHIN

A large number of patients and providers move regularly across New Hampshire’s 3 U.S. borders. Currently, if a patient’s information crosses the border there are sizable governance issues. Our approach

is architecturally and technically aligned with the NHIN and the state is committed to maintaining such alignment. We are also committed to participating in NHIN governance as it becomes articulated.

Our current plan is to deploy a NHIN gateway to connect with other states and regions as they become available. Our Phase 1 model deploys a NHIN gateway immediately in order to facilitate NHIN Direct transactions as soon as the specifications are available and to lay the foundation for more comprehensive exchange in conjunction with our neighboring states either through participation in NHIN Exchange and utilization of NHIN Connect, or in alignment with future NHIN solutions as appropriate.

State HIT Coordinator

The New Hampshire HIT Coordinator joined the State in May 2010 and has overall responsibility for facilitating collaboration between the leaders working on various aspects of HIT and HIE advancement. The HIT Coordinator is responsible for building and enhancing relationships with hospitals and healthcare providers to keep a finger on the pulse of their needs, concerns, and future initiatives. As described in the “coordination” sections of this plan, the HIT Coordinator has already made connections between the HIEPI project and many of the initiatives underway throughout the State, in New England, and at the national level.

The Coordinator is appointed by the Commissioner of the New Hampshire Health and Human Services and participates on several committees/initiatives. The NH HIT Coordinator serves as the project director for the HIEPI project. The NH HIT Coordinator is also a member to the New England States Consortium systems Organization (NESCO) and represents the interests and potential contributions of the State of New Hampshire in address issues, problems and opportunities in collaboration with all other New England states.

SP-8.2 Sustainability

Creating value for New Hampshire by facilitating health information exchange

A core tenet of the HIEPI project is to create an HIO and technical infrastructure that is valuable to all stakeholders. The project facilitates pooling of efforts and resources among the State's many stakeholders to build shared capabilities at lower costs than if stakeholders acted alone. The framework for HIE is being proposed through three building blocks that can each create value on its own. Secure routing provides a valuable foundation that may stand on its own, and that may be built upon for additional value realization if New Hampshire stakeholders decide to progress to additional building blocks. The following value propositions have been identified for each building block of the planning framework:

Value proposition for building block 1 - secure routing among providers

Secure routing offers healthcare providers a much more secure and private, timely, and efficient way to execute information sharing transactions than is currently available through the fax, mail, and telephone channels used today. Since a secure routing platform makes it easier to send care summaries, patient referrals, lab results, and other information, it is also likely that information sharing will occur where it does not occur today, creating value through increased coordination of care. Since the secure routing technical infrastructure will enable transfer of standardized structured data, many of New Hampshire's organizations will be able to take in patient information from other organizations without having to perform many manual processes that are in place today, such as data entry and document scanning. This can create value for all stakeholders through reduction in transcription error rates, reduction in administration time spent on data entry, and reduction in administrative costs.

Value proposition for building block 2 - secure routing to public health, NH Medicaid, and patients

By allowing secure routing to be used by patients, additional value may be created for patients and the stakeholders that serve them. Patients that are able to efficiently and securely access their information and organize this data through a portal or personal health record (PHR) will have the information needed to better manage their health, change unhealthy behaviors, and improve adherence to treatment plans. This may lead to better overall health, reductions in overuse of healthcare services, and cost savings.

The addition of public health and Medicaid as HIO participants may help improve population health initiatives while reducing the public health and quality reporting burden for hospitals and providers. More specifically, the information that hospitals and providers currently send to public health through multiple systems, each with its own rules and processes, may be securely and efficiently transferred through a single channel. On the receiving end of the transaction, public health agencies and Medicaid will be able to streamline information collection, reduce the number of systems in use, improve efficiency, and reduce costs.

Value proposition for building block 3 - Community Record

A community record creates value by aggregating and organizing information from the entire team of stakeholders serving a patient, regardless of provider location or organizational affiliation. A community record is patient-centric and can be appropriately accessed whenever and wherever the patient seeks care, providing each caregiver with a complete (or nearly complete) patient record. This information may help caregivers make better decisions regarding patient care leading to improved health outcomes, reduced medical errors, reduced duplicate or unnecessary tests, and reduced cost of care.

Sustaining the HIO

The HIO is expected to generate value for New Hampshire's stakeholders. A sizable challenge remains in capturing some of this value to operate the HIO. \$5.5 M in federal funds are being treated as one time "seed funds" which will facilitate the launch of the HIO and the creation of a technical infrastructure foundation for secure routing. However, the HIEPI project is still responsible for securing sufficient revenue to satisfy the match requirements of the contract with ONC in the near term, and to sustain the organization's operations in the mid and long term.

The HIEPI project will be developing a business plan throughout the autumn of 2010 for release in February of 2011 that will provide a detailed revenue model for the HIO. We have already begun discussions on how to sustain the HIO and these initial ideas are presented below. A consensus-based decision regarding the design of the revenue model and the business plan are expected to be reached toward the end of 2010.

Guiding principle for revenue model – sharing the benefits and the costs

The revenue model will be based upon the principle that many stakeholders will benefit from the HIO and that these stakeholders should share the costs of sustaining the HIO. This guiding principle accomplishes two objectives. First, by sharing costs among many stakeholders, the price of participation will be more affordable for all. Second, there will be no "free riders" benefiting from the investments of others without contributing themselves.

There is recognition that benefits accrue to stakeholders disproportionately, and conversely, that developing a formula to measure and adjust for this disproportionate value accrual will be complicated and will likely generate adversity among stakeholders who are currently committed to collaboration. Therefore, as feasible, costs will be shared equally among stakeholders.

Details regarding exactly who is considered to be an HIO stakeholder and some mechanisms for stakeholder contributions have been discussed in detail and are still being determined as part of the business planning exercise.

Prospective revenue models

Several revenue models are currently under consideration by New Hampshire stakeholders. To facilitate the discussion, revenue models from many of the leading and sustainable HIOs in the country have been evaluated for relevance to the NH marketplace. These models have been market tested among a small group of stakeholders and will continue to be discussed, checked for legal compliance, further market-tested, and refined leading up to the release of a business plan in February of 2011. The following revenue models are under consideration:

- Membership or subscription fees
- Transaction fees
- Claims or covered lives based fees
- Insurance premium taxes
- License surcharges
- Performance payment based models

Cost considerations

An initial cost estimate has been developed and is presented in detail within the Operational Plan. As New Hampshire currently does not have an organization in place to facilitate collaboration among healthcare stakeholders, cost estimates have been included for the design, launch, and operations of a new HIO

organization. The estimated cost for the design and launch of the phase 1 secure routing technical infrastructure and for the design, launch, and operations of a new HIO totals \$8.9 M for federal fiscal year 2010 – 2014.

The Cooperative Agreement provides approximately \$5.5M in federal funds which, even with the addition of matching funds, falls short of our current budget estimate. We will work aggressively to reduce costs through in-kind contributions from stakeholders and shared service approaches with hospital systems and with other states (for example, regional approaches to provider directories). We also anticipate that the more focused business engagement process that we will undertake over the remainder of the calendar year for the creation of the business plan will identify revenue opportunities from provider organizations seeking lower-cost solutions for achieving Stage 1 and future meaningful use requirements.

Cash flow considerations

There is a time lag between when costs will occur and when the HIO is fully functional and creating value for stakeholders. Federal funds will cover the majority of startup costs but not all. Therefore, it will be necessary to secure some funds ahead of full launch of the HIO services. To do so, several options are under consideration including seeking State contributions, and requesting private contributions before the HIO is fully operational. The cash flow issues will continue to be discussed with expected resolution in the business plan.

SP-8.3 Architecture and Standards

Architecture for the Exchange of Health Information

The New Hampshire Health Information Exchange service will be a flexible and scalable standards-based infrastructure which will build a Phase 1 platform for secure routing that can be expanded after further stakeholder deliberation to Phases 2 or 3. The infrastructure will be built according to the following architectural principles:

1. **Leverage existing infrastructure – Create a Network of “HIE clusters:”** There is significant local and regional health information exchange occurring within health systems. These “HIE clusters” may be connected to facilitate secure exchange among HIE clusters.
2. **Lean Infrastructure providing Value Added Services:** The HIO should focus on providing core infrastructure and services to facilitate secure routing of information between “HIE clusters”, and policy guidance and coordination/outreach/alignment assistance to facilitate secure routing of information within “HIE clusters”.
3. **Implementation of National Standards:** Standards as specified by the Meaningful Use Final Rule, the Standards Final Rule, the Certification Final Rule, and other provisions of HITECH and HIPAA will be strictly adhered to.
4. **Global Addressing:** This is a core service required to support the secure routing of health information between provider entities within the state.
5. **No Access to PHI:** Exposing Protected Health Information is not necessary for purposes of routing data as part of the initial phase of the project.
6. **Brokered Chain of Trust:** The HIO will act as a trust broker between the various HIE clusters facilitating local exchange of health information in the state.
7. **Security and Encryption:** Ensuring the security and privacy of patients’ health information is paramount; use of encryption technologies is a foundational requirement.
8. **First PUSH, then PULL (if/when agreed upon):** Information will be sent or “pushed” from one healthcare provider to another known healthcare provider. No information will be queried or “pulled” in phase 1. If and when stakeholders are ready to address the financial, policy, and operational complexities inherent in “pulling” information, additional planning activities will be undertaken.
9. **Federated Patient Consent Management:** The HIE clusters will be responsible for ensuring that the release of health information via the HIO will be done per the requisite regulations, policies and procedures.
10. **Ensure Data Integrity:** The HIO will ensure that data is not altered while in transit between the sender and the recipient.
11. **Do not overburden the HIE clusters that are facilitating local exchange of health information:** The HIO will try to minimize the level of effort required by the HIE clusters to connect to and interoperate with the HIO.

These principles and their application as part of the proposed architecture will be further defined and discussed in the Operational Plan.

As part of the two stage technology evaluation and procurement process, first Request for Information (RFI), then Request for Proposal (RFP), the HIO will complete an assessment of the technology or solutions available in the market to ensure compliance with the standards published by the US Secretary

of the Department of Health and Human Services (HHS) and will only utilize systems, solutions and technologies which meet these requirements.

Fundamentally, the statewide network will provide a core backbone of services essential to tie together and provide secure exchange of clinical data among existing provider networks in compliance with current New Hampshire statutes regulating health information exchange.

The proposed secure routing architecture will be a safe, secure and scalable network of federated HIE clusters which are currently distributed across the state. The architecture will be extensible and may evolve in future phases as determined by New Hampshire's stakeholders. For example: the federated architecture could be coupled with a centralized data repository used for purposes of quality reporting; a provider portal (or "EHR Lite") solution could be added to provide access to vital health information to those clinicians without an EHR; or a patient portal could be added to provide patients with access to their personal health record.

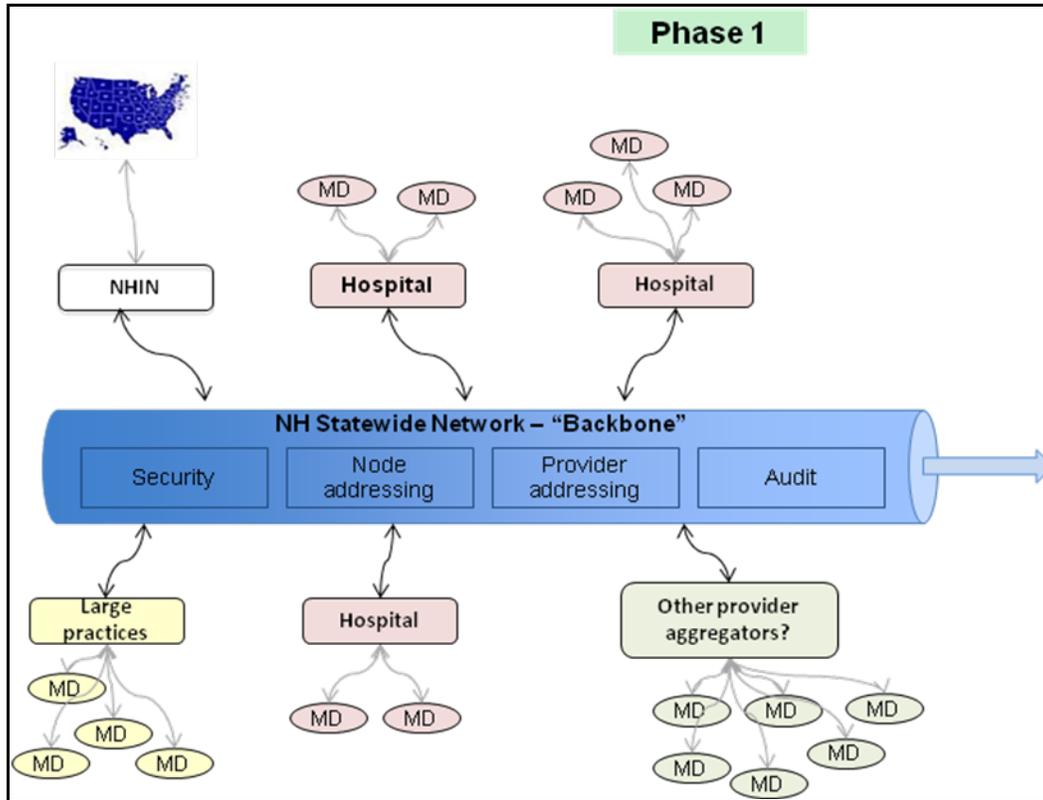
The initial technical architecture addresses the critical gap of inter organizational electronic exchange of patient health information for purposes of care coordination. If the New Hampshire policy framework allows electronic health information exchange with public health agencies in the future, the same foundational infrastructure can be used to securely and efficiently route data required for purposes of public health, such as lab results (e.g. notifiable events), syndromic surveillance, and submission of immunization information.

This enterprise service bus (ESB) model will be implemented as per phase 1 below. Phases 2 and 3 are also presented here to describe the ways which the Phase 1 platform can be built upon for future expanded uses should such expansion become legal and desirable.

Phase 1 architecture

Phase 1 architecture includes the HIO backbone of core services (Security, Node Addressing, Provider Addressing, and Auditing) to facilitate secure routing of clinical data from a sender to a known, intended and addressable recipient.

Figure 19: Phase 1 HIE Architecture



This architecture offers the basic services required to support secure “push” routing of patient care summaries, continuity of care documents, or lab results between existing health information exchange networks, or HIE clusters, used by physicians employed by or affiliated with hospitals, large multi-specialty practices, and other provider aggregators. In essence, these HIE clusters will serve as “on-ramps” to the HIO. This represents the priority as identified by the statewide consensus process and the associated use cases.

This strategy is reliant upon a base level of capability among the HIE clusters for enabling stage 1 meaningful use transactions, for meeting Program Information Notice (PIN) requirements (e-prescribing, structured lab result exchange, and patient summary of care exchange), and for connecting local HIE networks to a statewide network. We will help prospective HIE clusters to assess capabilities relative to these requirements, identify capability gaps, and create a roadmap to address these gaps. We will then help organizations execute upon their roadmaps by connecting organizations to resources, facilitating cross-organizational collaboration, and providing direct assistance to connect HIE clusters with the statewide network. HIE clusters will connect to the statewide HIE network using uniform, standard protocols as required by HHS/ONC from the NHIN or other widely accepted messaging platform(s) where HHS/ONC has not designated standards; where there are not existing standards the HIO will establish standards and protocols.

Push routing is defined as the asynchronous transfer of data (typically unsolicited) or a request for data from a sender to a known recipient. The analogy best used to explain data push is the “FEDEX” model, where a message or data package (containing a payload of health information) is securely delivered from a sender to a known recipient without the package ever being opened and with the delivery transaction being logged in an auditable manner. This will replace existing un-secured and non-electronic means of exchanging data (e.g. mail, email, faxing, etc.)

We are in full agreement that adherence to standards is required to limit complexity as HIE clusters connect to the statewide network and as HIE clusters connect to entities in other states. It will be our policy that the payload of health information will be “closed envelopes of personal health information” as in the FEDEX model alluded to earlier, and thus will not be viewable by the HIO in our model. This approach is consistent with Directed Exchange principles endorsed by the federal Privacy and Security Tiger Team and NHIN Direct. This will prevent our being able to monitor adherence to interoperability standards between sender and receiver. We will instead manage the endpoints by requiring that each HIE cluster use only certified health IT systems and adhere to implementation guides for CCD-C32 and HL7 2.5.1 formats and content.

Adherence to HHS-adopted standards will be a requirement of participation for all HIE clusters and we will implement a process for testing standards conformance and for certifying HIE clusters prior to their connection to the statewide network. To encourage ongoing adherence to HHS-adopted interoperability standards, the HIO will adjudicate among participant nodes where adherence to format or semantic standards is in dispute. An alternative to making this a requirement would be to have our planned provider directory allow discoverability of each cluster’s service capabilities which would promote market enforcement of standardization. A large number of stakeholders expressed interest standardizing content and format during our deliberations and we are thus confident that we will be able to create a policy and assistance framework for achieving this important objective.

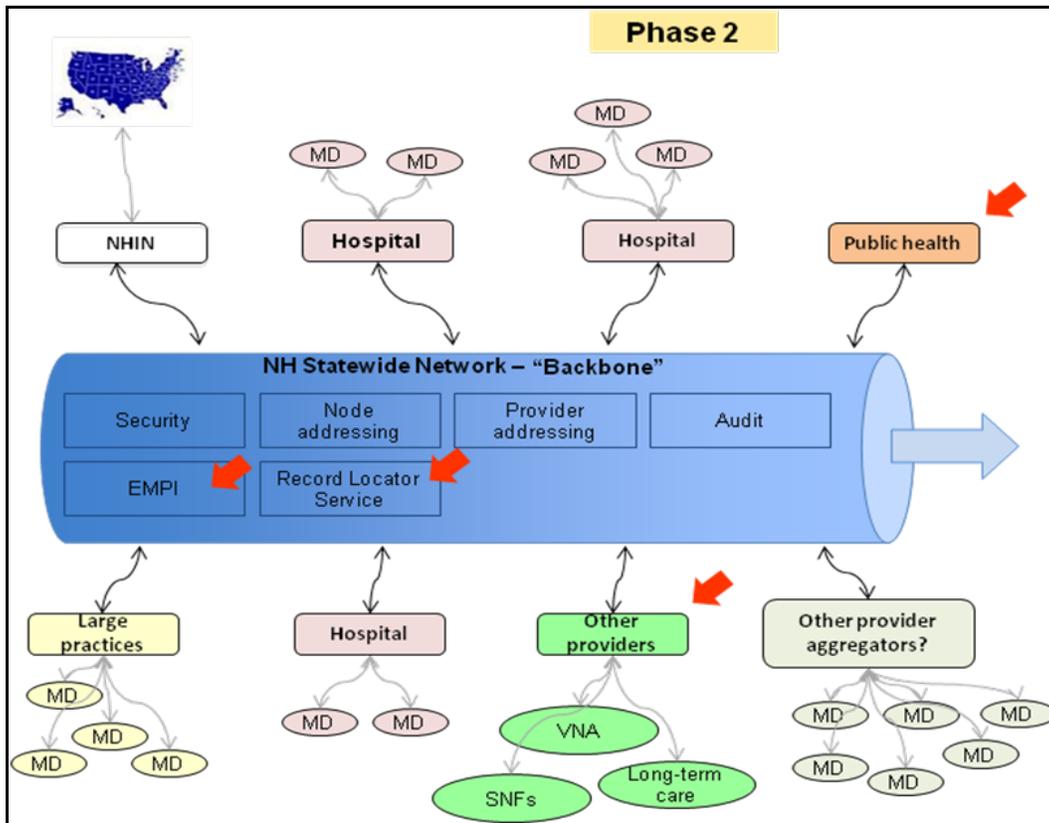
Independent physicians (34% of total physicians who are currently not affiliated with a hospital system or other HIE cluster of health information technology capabilities) will be encouraged to join an existing HIE cluster. If it is not feasible for such a non-affiliated physician to join an existing HIE cluster they will be encouraged to join together with physicians in similar circumstances to create a new HIE cluster. The HIO could potentially provide some support for the formation of a new HIE cluster, but will not itself provide that service as a component of the phase 1 given budget constraints.

The phase 1 architecture will also function as the on-ramp to the Nationwide Health Information Network (NHIN) for purposes of cross-border health information exchange with entities in other states, and health information exchange with federal organizations (e.g. VA, DoD, CDC, etc.)

Phase 2 architecture

Phase 2 architecture layers additional services (Enterprise Master Patient Index (EMPI) and Record Locator Service (RLS)) to facilitate pull of data. Phase 2 includes additional healthcare organizations and may include non-provider participants given the future legal framework for state-level HIE in New Hampshire.

Figure 20: Phase 2 HIE Architecture



This phase of the extensible and scalable architecture will provide additional core services to facilitate the on-demand pulling of patient health information from all organizations which both know and have any health information about a particular patient. The typical use case to illustrate the concept of pulling data is an emergency room provider caring for a patient who may not be able to communicate where they've previously sought health care services.

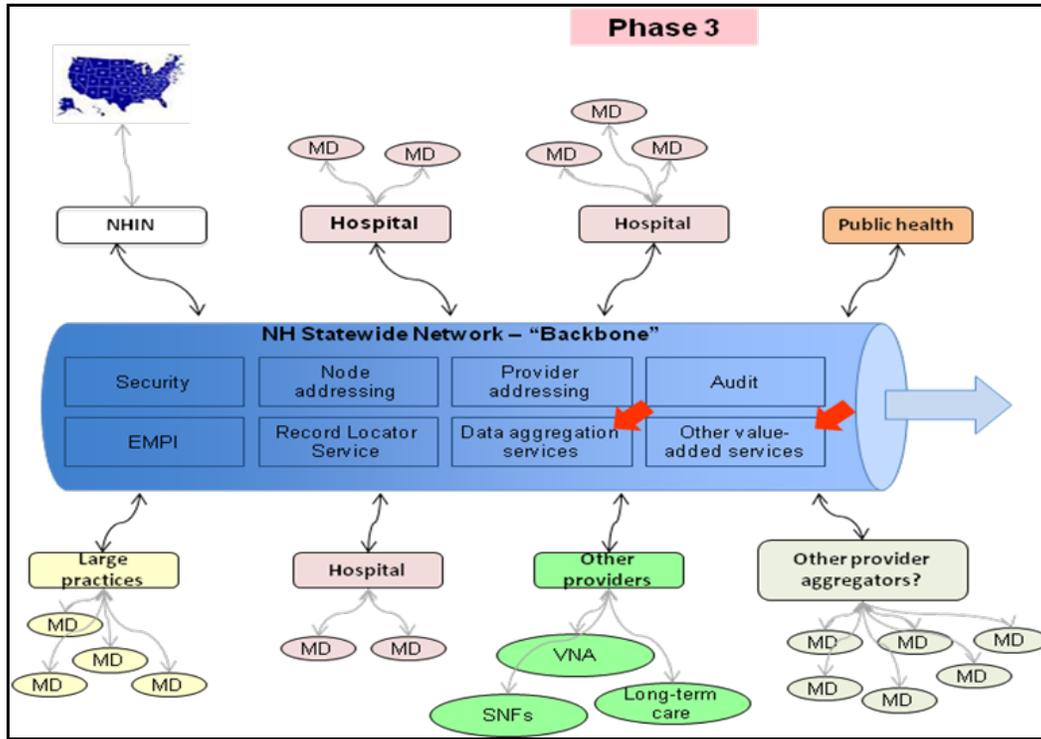
Phase 2 will also expand availability to include other health care providers, such as Home Health Providers, Visiting Nurses Associations (VNAs), Skilled Nursing Facilities (SNFs) and Long Term Care facilities in the state. The goal is to expand the scope of care coordination wherever and whenever a patient is seen across the continuum of care.

Also, should the New Hampshire regulatory environment change to allow it, electronic health information exchange with non-provider entities and public health organizations/agencies would be enabled during this phase. This is a key requirement of meaningful use and a significant gap which exists in the current health information exchange environment.

Phase 3 architecture

Phase 3 architecture provides central aggregation and merging of records from various clinical entities and services to support other value added functions (e.g. quality reporting registries).

Figure 21: Phase 3 HIE Architecture



Phase 3 architecture facilitates an aggregated and merged community record for residents of NH across all data sources in the state with query capabilities to find and pull any data available about any patient at the point of care given appropriate consent. (Note: this phase does not require that all patient records be physically stored in a centralized database, this function can be accomplished with a central record locator service with data stored within each participating HIE cluster.)

Alignment with NHIN

One of the core tenets of the architecture is for it to serve as a gateway to the Nationwide Health Information Network (NHIN) for all providers in the state. We are currently and will continue to follow the developments with the NHIN Direct Implementation working group and will incorporate NHIN Direct and/or NHIN Exchange where and when it's appropriate.

The NH infrastructure will be scalable and will use the NHIN Gateway to integrate with the regional VA facilities (VA Medical Center in Manchester serving south and central NH, VA Medical Center in White River Junction, Vt., serving northern NH) and Department of Defense (DOD) facilities, such as the Portsmouth Naval Shipyard.

The NHIN Gateway would also be used to exchange patient health information with entities that might exist in neighboring states or any state in the country; thus supporting the cross-border trading of patients seeking care in neighboring states (or vice versa). There is significant cross-state patient traffic today with considerable inflow of patients from Vermont to Dartmouth/Hitchcock on the western border and considerable outflow of patients to tertiary facilities in Boston to the south. This will also be a significant service given the large number of seasonal tourists who visit New Hampshire and the NH residents with seasonal residences outside of New Hampshire.

Approach to Implementing Standards and Certification

The HIO will be in *strict compliance with all national standards* as defined in the HITECH Act, the final Standards and Certification Criteria used to support the Final Rule on Meaningful Use for content, vocabulary as well as privacy and security. In addition, the HIO will obtain the requisite certification if and when a nationally accredited certification program is offered. The state of NH will take advantage of this opportunity to provide leadership in establishing statewide standards and requirements for HIE which will be based on the following national standards.

Content: The data payload(s) will be exchanged using the HL7 standards: the Clinical Document Architecture (CDA) Release 2 Continuity of Care Document (CCD) which will be implemented using the HITSP C32 CCD specification for purposes of exchanging clinical summaries, and HL7 2.5.x messaging standard which will be used for purposes such as electronic lab results delivery, possible future (Phase 2) public health surveillance reporting (e.g. Public Health Information Network (PHIN)) as well as immunization registry functions.

Vocabulary: Should we move beyond phase 1 to semantic unification of records, we will utilize standardized code sets and nomenclature such as:

- ICD-9/ICD-10 for indicated conditions,
- SNOMED-CT for clinical terminology,
- CPT-4 for procedures,
- LOINC for laboratory results,
- RxNorm for medications, and
- CVX for immunizations.

Privacy and Security:

1. **Encryption:** Transport Layer Security (TLS/SSL v3.0) using X.509 certificates will be utilized to encrypt transmitted data. Other encryption will be layered on as and when needed (e.g. encryption of data at rest).
2. **Auditing:** Transactions will be recorded when electronic health information is routed via the HIO (source, destination, message ID, date and time) created, modified, accessed, and deleted to include which actions were completed, by whom (ID or username), when (date and time), and from where (host address/name).
3. **Data Integrity:** The Secure Hash Algorithm (SHA-1), as specified by NIST, will be used to verify that electronic health information has not been altered in transit (between end points).

The HIO will, as a matter of policy, require that all participating HIE clusters comply with and enforce the HITECH enhanced HIPAA privacy and security rules. This is addressed in more detail in section SP-8.5 (HIE Privacy and Security) of the strategic plan. Current and future HIE clusters and provider organizations will be strongly encouraged to select only those vendors and implement only those technologies which either are currently compliant with or are on pursuing a product development road map which commits them to comply with these standards and requirements.

SP-8.4 Services and Operations

Services

The services we propose for the first phase of implementation will facilitate a set of transaction types are defined below. Potential phase 2 and phase 3 transactions are also described and these may be implemented in accordance with change in New Hampshire law and future direction from stakeholders.

Detailed in the Office of the National Coordinator for HIT (ONC) Program Information Notice (PIN) are requirements to “ensure that all eligible providers within every state have at least one option available to them to meet the HIE requirements of meaningful use in 2011.” There is a strong emphasis in the PIN for the following 3 services.

- E-prescribing
- Receipt of structured lab results
- Sharing of patient care summaries across unaffiliated organizations

The infrastructure for e-Prescribing is already in place with approximately 96% of community pharmacies accepting electronic prescriptions. Therefore, we focus our technical strategy on the receipt of structured lab results and care summary exchange. We used a planning approach utilizing a set of use cases (technical scenarios) from NHIN, HITSP, NHHA and HIEPI workgroup meetings to determine services required in New Hampshire’s HIE development. The following decision tree guided prioritization of the transactions that may be supported in the initial and subsequent phases based on determination of:

- Legality: Adherence with NH State Law
- Difficulty: Technical, Business/Governance, Legal complexity
- Financial Viability: Costs within bounds of predicted project revenue
- Demand: Stakeholder interest; federal/state requirements (Note: Meaningful Use was one of the main demand drivers considered for prioritization. The final rule was released after the prioritization was completed and vetted with stakeholders for consensus agreement. We plan to revisit the use case prioritization in light of the final rule, make adjustments, and vet the changes with stakeholders.)
- Current market availability: Ability of stakeholders to procure service through existing market health information exchange services

Figure 22: Project Sequencing Decision Tree



Phase 1

Table 24: Phase 1 Use Cases

ID #	What	From whom	To whom	Phasing	Main reason for Phase categorization
1	Hospital discharge summary	Hospital	Hospital	1	MU and NHHA-consensus priority
2	Key clinical information summary	Hospital	Hospital	1	MU priority
3	Request for key clinical information	Hospital	Hospital	1	Multiple hospital request
5	Imaging reports	Hospital	PCP or specialist	1	Available only in larger hospital systems today
6	Lab results	Hospital	PCP or specialist	1	
7	Request for key clinical information	Hospital	PCP or specialist	1	
9	Hospital admission notification	Hospital	Referring Hospital	1	Continuity of care priority
10	Hospital admission notification	Hospital	Referring physician and/or PCP	1	
11	Hospital discharge summary	Hospital	Referring physician and/or PCP	1	MU and NHHA-consensus priority
12	Hospital ED visit summary	Hospital	Referring physician and/or PCP	1	MU priority
16	Referral -- Summary of care record	PCP	Specialist	1	MU and NHHA-consensus priority
17	Key clinical information summary	PCP or specialist	Hospital	1	MU priority
18	Referral -- Summary of care record	PCP or specialist	Hospital	1	MU and NHHA-consensus priority
27	Consult note -- Summary of care record	Specialist	PCP	1	MU and NHHA-consensus priority

In Phase One, we plan to develop a lean technical backbone for secure routing of clinical documents and information from provider to provider. The Phase One infrastructure will specifically facilitate the exchange of information required for Stage 1 Meaningful Use and by the Program Information Notice, including structured lab results delivery and patient care summary delivery across organizational lines. As explained earlier, we will not facilitate e-prescribing transactions, as they may be conducted with systems (e.g., electronic medical record or standalone ePrescribing solutions) already in place in the State.

Phase One infrastructure incorporates the following capabilities:

- Secure routing across HIE clusters

- Secure routing within HIE clusters where not currently available
- Secure routing with entities outside of hospital HIE clusters
- Secure routing with NHIN
- Authentication & secure transport
- Provider entity registry
- Provider directory
- Message format translation & validation
- Message routing
- Delivery acknowledgement
- Audit/logging
- Delivery adaptors

Phase 2

Table 25: Phase 2 Use Cases

ID#	What	From whom	To whom	Phasing	Main reason for Phase categorization
4	Hospital discharge summary	Hospital	Other care settings	2	Technical requirements of other care settings unknown
19	Lab order	PCP or specialist	Hospital	2	Requires workflow change planning with labs
25	Lab results	Public health lab	Hospital	2	Low demand
26	Lab results	Public health lab	PCP or specialist	2	
30	Immunization record	Hospital	Public health	2	Restricted by law
31	Reportable lab results	Hospital	Public health	2	
32	Syndromic surveillance data	Hospital	Public health	2	
33	Reportable conditions	Hospital	Public health	2	
36	Laboratory ordering decision support	Payers	PCP or specialist and hospitals	2	
39	Immunization record	PCP or specialist	Public health	2	
40	Syndromic surveillance data	PCP or specialist	Public health	2	
41	Reportable conditions	PCP or specialist	Public health	2	
48	Community record	Multiple sources	Hospital	2	Technically, organizationally, and legally complex; requires funding outside of HIE grant
49	Community record	Multiple sources	PCP or specialist	2	
50	Medication history	Other clinical sources	Hospital	2	
51	Medication history	Other clinical sources	PCP or specialist	2	

In Phase Two we could augment the systems capabilities by providing Expanded Secure Routing with delivery to non-provider entities & patients (entities not permitted by current NH law). In this phase we add technical complexity to the services of the HIO and address legal constraints for data sharing. The following services are added in Phase Two:

- Non-provider entity registry (e.g. Patient, Public Health, Medicaid)
- Secure routing to public health
- Secure routing to other clinical entities
- Limited Record locator service for patient information queries
- Add delivery to patients with Patient directory with Enterprise Master Patient Index (EMPI), which requires patient-matching and authentication.
- Add delivery adaptor for translation across systems and organizations

Phase 3

Table 26: Phase 3 Use Cases

ID #	What	From whom	To whom	Phasing	Main reason for Phase categorization
8	Images	Hospital	PCP or specialist	3	Technically and organizationally complex; PACs view capability
13	Images	Imaging center	PCP or specialist	3	
14	Imaging reports	Imaging center	PCP or specialist	3	Relatively low demand for non-hospital centers; technical capabilities of imaging centers unknown
15	Lab results	National lab	PCP or specialist	3	Already widely available in market
20	Imaging order	PCP or specialist	Imaging center	3	Relatively low demand for non-hospital centers; technical capabilities of imaging centers unknown
21	Lab order	PCP or specialist	National lab	3	Already widely available in market
22	eRX	PCP or specialist	Pharmacy	3	
23	Medication history	Pharmacy	Hospital	3	
24	Medication history	Pharmacy	PCP or specialist	3	
28	Quality measures	Hospital	CMS and/or NH Medicaid	3	Restricted by law; technically and organizationally complex
29	Claims submission & eligibility check	Hospital	Health plan	3	
34	Radiation exposure report	Hospital	Radiation exposure registry	3	
35	Radiation exposure report	Imaging center	Radiation exposure registry	3	
37	Quality measures	PCP or specialist	CMS and/or NH Medicaid	3	
38	Claims submission & eligibility check	PCP or specialist	Health plan	3	
42	Public health alerts	Public health	Hospital	3	
43	Public health alerts	Public health	PCP or specialist	3	Restricted by law; low demand as an HIE service
44	Discharge instructions	Hospital	Patient	3	
45	General medical summary	PCP or specialist	Patient	3	Restricted by law; technically and organizationally complex
46	Post-visit summary	PCP or specialist	Patient	3	
47	Public health case investigation info	Hospital	Public health	3	
52	Public health case investigation info	PCP or specialist	Public health	3	

With each phase more complex than the last, Phase Three incorporates a Community Record, with merged medical records and added pull capability to query health information via the HIO. The following are the services added in this phase. Clinical data repository & viewer, which requires management of end-user

- Full Record Locator Service for patient information queries
- Centrally orchestrated merging of records across clinical entities
- Quality registries

Approach to Building upon Existing HIE Capacity

The HIO will serve as a collaborative network that will build upon the capabilities in place throughout the State and will enable all participating providers to achieve Stage 1 Meaningful Use requirements. Given this environment, our approach is to create a network of HIE clusters, linking the currently unconnected enterprise HIE clusters. This approach will maximize utilization of the current HIE infrastructure, and enable connecting a large number of providers in the state with a lean infrastructure in a short timeframe.

This technical infrastructure will address existing gaps, particularly with respect to lab results delivery and summary care exchange capabilities. We must consider:

- Employed and affiliated physicians within hospital service areas who do not yet receive MU-level transactions through their hospital network as well as ambulatory physicians outside of existing hospital networks for whom no plan exists today for health information exchange
- Hospital-to-hospital exchange, which is mostly non-existent except for a very small number of bilateral exchanges between hospitals

- Cross-state health exchange for all hospitals and physicians, for which no electronic exchange capabilities exist today

Current law places restrictions on the types of transactions that can be conducted by a collaborative HIE entity and places requirements on operational aspects of the entity so transactions through an HIE entity are only allowed for information sharing among providers for treatment purposes. Excluded transactions include transactions that include the patient, public health reporting, and quality reporting to State Medicaid and CMS. Additionally, the law requires patient opt-out for any transactions conducted by the HIE entity, and audit of all transactions including sender, receiver, and identification of patient. It is also important to note that although public health reporting is statutorily required, current law does not allow such transactions to be brokered by an HIE entity. This means that there are currently a wide variety of public health reporting requirements and systems, but forces ad hoc point-to-point electronic and non-electronic solutions between providers and public health.

Our multi-phased implementation approach to HIE takes the current legal constraints into consideration and expands upon the existing infrastructure to ensure that all eligible providers within the state are connected and can meet patient health information exchange requirements for meaningful use in 2011.

We worked through a series of use cases to reach consensus and prioritize the service offerings of New Hampshire's HIO. Ongoing prioritization of the use cases will largely be driven by the market and federal and state regulatory changes. Prioritization will also be based on existing workflows, resources, and revenue stream.

Approach to Information Exchange with Other States and Federal Agencies via NHIN

Alignment with the NHIN has two components: governance and technology.

New Hampshire's governance model is well-positioned to be compatible with the emerging NHIN governance principles and functions. The major NHIN governance functions defined by the NHIN governance workgroup include:

- Development of the Strategic Direction;
- Development and Maintenance of the NHIN Policies, Procedures, Reference Materials and Support Services;
- Development of the Legal Infrastructure;
- Management of Participation in the NHIN;
- Dispute Resolution;
- Governance of NHIN Support Services; and
- Managing Risks to the Confidentiality, Privacy and Security of Information.

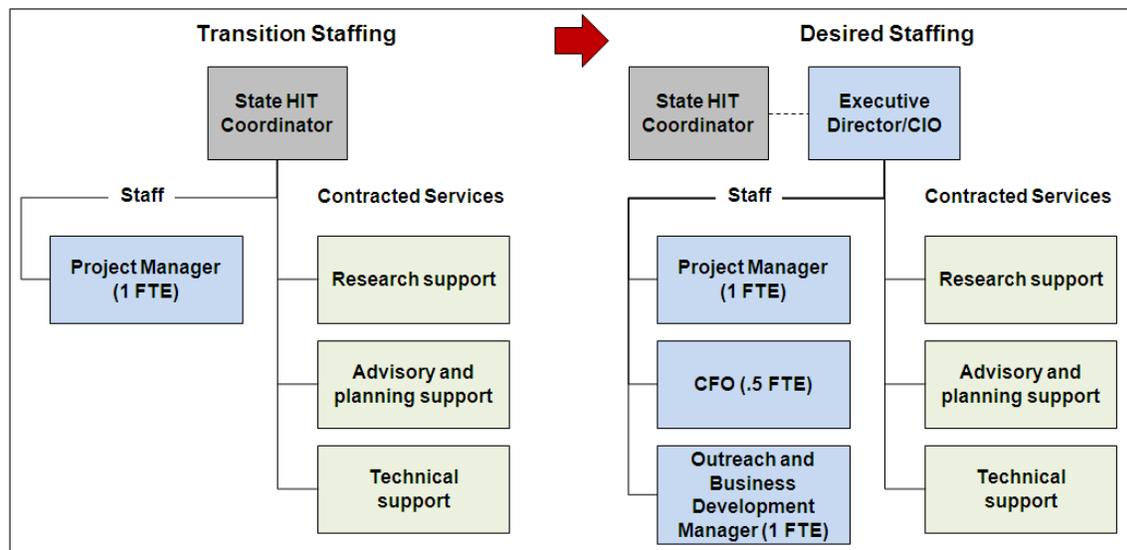
HIEPI has parallel governance functions and therefore will be in a position to join the NHIN once the technology infrastructure is in place. From a technology perspective, an NHIN Gateway is part of the Core Services. The HIO will connect with the NHIN according to specifications determined by the NHIN workgroup and conform to the standards already specified by the NHIN in the NHIN Production Specifications as noted in the Technical Infrastructure section "Alignment with NHIN".

Approach to Staffing and Hiring

In order to design and launch the HIO organization and technical infrastructure and to deliver the services described above, we will put a lean staff in place. This staff will be supported by volunteers and by contractors where specific expertise or short term capabilities are required. In the near term, the HIO will be staffed by the Office of Health Information Technology (OHIT) within NH DHHS under the leadership of the State HIT Coordinator. Given the launch of a separate HIO, staffing will be transferred to the new HIO and additional positions will be added. Figure 23 illustrates the HIO staffing for the

transition period (anticipated for October 2010 to June 2011) and the staffing for the new HIO once established.

Figure 23: HIO staffing model



Anticipated staffing includes a single point of HIO leadership. Initially, the State HIT Coordinator will provide this leadership. Once the new HIO is established, we will conduct a search for an Executive Director. A project manager is currently in place within OHIT to support day to day operations. We anticipate that this function may be transferred from OHIT to the new HIO once launched but this is still under discussion.

Given the reporting requirements of the cooperative agreement with ONC, ARRA reporting, and the complexities of managing public and private revenue, it will be necessary to hire a part time CFO. An Outreach and Business Development Manager position is also needed to both engage stakeholders as customers and to generate revenue to sustain operations.

Contractors will be used for functions that require specific expertise and for limited term initiatives. These functions include research support, advisory and planning support, and technical support. The University of New Hampshire and the Massachusetts eHealth Collaborative are currently engaged as contractors and we anticipate the addition of a technical support contractor to provide technical infrastructure for secure routing.

Volunteers have been an invaluable source of ideas and planning capacity to date and will continue to be engaged to support the project.

Approach to Management

The project will be managed by the HIO which is described above. Operational responsibilities include the following:

- Program management – ensuring that the HIO provides its customers with high quality, reliable services for secure routing of health information
- Vendor management – ensuring that vendors are properly selected and that once engaged, vendors meet program requirements and comply with delivery schedules
- Future planning – supporting the continuation of an inclusive, multi-stakeholder planning process for the design of future HIO services and supporting capacity

- Partner collaboration – working with the wide range of partners identified in this plan to accomplish shared goals together and with minimal duplication of efforts
- Financial management – ensure the proper management of all finances including; revenue management, budgeting and cost management, accounting, control systems, and audit
- New business management – cultivate new customer relationships, develop contracts with these customers, and secure revenue for services
- Communications management – facilitates communication between stakeholders and the HIO and stakeholders and each other to enable continued collaboration
- Technical operations – ensure that technology infrastructure performs as required – this includes certificate authority and management, ‘Micro data center’ operations, and maintenance and upgrade planning and management among other duties

Approach to Risk Management

The HIO management team will review project scope, budget, quality, resources, schedule and risk on an agreed-upon basis (typically monthly or bi-monthly) to assess progress and technical or other constraints that may impede progress if not addressed. The program, project and communications managers will identify the requirements, manage the communication process both internally within the core team and externally with stakeholder representatives to ensure quality, risk and project controls. For the duration of the project, progressive collaboration will be of paramount importance. Any issues will be monitored to their resolution. Project risks will be documented and assessed to evaluate if mitigation plans are necessary. A reiterative business and project requirements process will surface any changes to required end dates, functional, technical and legal requirements, mapped to tasks and milestones, which are recorded in a project plan.

Note: Specific risks for the HIO are identified in the Risk Identification and Mitigation Section at the end of the Operational Plan.

Approach to Communications and Outreach

We have established a Communications Workgroup to address all phases of communication, education and outreach related to HIE. As discussed in other sections of this plan, one of the strategies for achieving the vision for HIE is to transition to a self-sustaining HIO in the form of a public instrumentality.

Therefore the communication strategy must address the communication needs of both the interim/transition phase as well as the future state phase. For each phase, the Communication workgroup will ensure that appropriate communication vehicles are being used to reach the target audiences in a timely and cost effective manner and that the messages delivered are consistent with the vision and goals of the project.

The Communication Plan for the transition phase will build the groundwork for going forward. The plan will articulate the overall objectives, define the roles and responsibilities of the communication workgroup, identify and begin appropriate communication/outreach activities and will be facilitated using a communication tracking tool to ensure all communications are done in a timely manner.

Communications responsibilities will be transitioned to the new HIO upon its launch.

Communication activities may include: Development of a web presence; Use of social media; General awareness campaigns; Stakeholder education; Collaboration and relationship development; Stakeholder outreach; Partner/Vendor outreach; and Publishing achievements and updates.

SP-8.5 Privacy and Security

Privacy and Security Framework

New Hampshire, like all states, is subject to federal health privacy statutes and regulations as well as federal law governing the confidentiality of certain substance abuse records. HIPAA makes Protected Health Information (PHI) about patients available for purposes of treatment, payment, and health care operations, as defined, and available for other uses, such as research or marketing, only upon specific patient authorization. The HIO will, pursuant to HITECH, be directly subject to HIPAA and be regulated as a Business Associate, thereby being subject to the Privacy and Security Rule as well as the terms of the Business Associate Agreement (a/k/a Trust Agreement) that the HIO must enter into with all participating Covered Entities that provide Protected Health Information to the HIO. In addition, NH's HIO will be subject to specific NH medical privacy laws and the HIE statute, as described below.

Summary of Existing HIO and Health Privacy Laws

State HIE Law: New Hampshire defines the term Health information Exchange to mean an entity established for the primary purpose of enabling and overseeing the exchange of protected health information (PHI) *for clinical decision-making purposes*.¹ The law further restricts the exchange of PHI through the HIE *to providers only*.² The HIE must adhere to the PHI requirements for providers under federal and state law.³ The HIE law specifically requires an HIE entity to maintain an audit log of health care providers who access PHI, including: (a) The identity of the health care provider; (b) The identity of the individual whose PHI was accessed; (c) The date the PHI was accessed; and (d) The area of the record accessed.⁴

Under New Hampshire law an individual must be given an opportunity to opt out of sharing his or her name and address and his or her protected health care information through a health information exchange.⁵ Providers may not be required to participate in an HIE entity as a condition of payment or participation.⁶

State Health Privacy Laws – General: New Hampshire statutorily grants a patient the right to access a copy of her medical record in the possession of a health care provider or a health care facility.⁷ The state restricts the disclosures these entities may make of confidential medical information (typically only for treatment purposes). There are privacy protections addressed in other statutory provisions governing specific entities or medical conditions, as discussed below. Individuals have a private right of action for unauthorized disclosures.⁸ Providers must report security breaches to individuals not only as required under federal law, but also if the disclosure was permitted under HIPAA but was disallowed under state restrictions on marketing and fundraising.⁹

¹ N.H. Rev. Stat. § 332-I(II)(c).

² N.H. Rev. Stat. § 332-I:3 (I).

³ N.H. Rev. Stat. § 332-I:3 (II).

⁴ N.H. Rev. Stat. § 332-I:3(III).

⁵ N.H. Rev. Stat. § 332-I:3(VI).

⁶ N.H. Rev. Stat. § 332-I:3(V).

⁷ N.H. Rev. Stat. § 332-I:1 (I).

⁸ N.H. Rev. Stat. § 332-I:6.

⁹ N.H. Rev. Stat. § 332-I:5.

New Hampshire law prohibits providers from revealing confidential communications or information “without the consent of the patient, unless provided for by law or by the need to protect the welfare of the individual or the public interest.”¹⁰ Our discussions to date indicate that hospitals and other providers in the state have varying practices regarding the sharing of information for treatment purposes, and those variations may be related to differing interpretations of this provision and how it should be applied in practice.

Condition-Specific Privacy Laws

Cancer: New Hampshire maintains a cancer registry for the compilation and analysis of information relating to the incidence, diagnosis, and treatment of cancer.¹¹ All health facilities are required to provide a report to the cancer registry containing information regarding a cancer diagnosed or being treated.¹² Reports that disclose the identity of an individual, who was reported as having a cancer, may only be released to persons demonstrating an essential need for health-related research, except that the release is conditioned upon the personal identities remaining confidential.¹³

Communicable Diseases: Physicians and others are required to report to the commissioner of health the name, age, address and other identifying information of those suspected of or diagnosed as having a communicable disease.¹⁴ These reports and any other information gathered as part of a public health investigation or examination that identifies the individual investigated or examined may only be released to persons demonstrating a need that is essential to health-related research or to protecting the health of the public.¹⁵ Any release of information pursuant to this provision is conditioned upon the personal identities remaining confidential.¹⁶

Genetic Testing: New Hampshire statutes place numerous restrictions on the use and disclosure of information derived from genetic testing.¹⁷ For purposes of these provisions, “genetic testing” is defined as a test, examination or analysis that is generally accepted in the scientific and medical communities for identifying the presence, absence or alteration of any gene or chromosome, and any report, interpretation or evaluation of such test. It does not include lawful tests undertaken for determining whether an individual meets reasonable functional standards for a specific job or task.¹⁸

Genetic testing may not be performed without the prior written and informed consent of the subject of the test.¹⁹ No person may disclose that an individual or a member of the individual’s family has undergone genetic testing or may disclose the results of the test without the prior written and informed consent of the individual. Disclosure without the consent of the subject is permitted: as required to establish paternity; as required for reporting tests on newborns for metabolic disorders; for purposes of criminal investigations and prosecutions; and as necessary to the functions of the office of the chief medical examiner. Discussion and disclosure of genetic testing for a patient, requested of a physician by a patient,

¹⁰ N.H. Rev. Stat. § 332-I:2 (I)(e).

¹¹ N.H. Rev. Stat. § 141-B:5.

¹² N.H. Rev. Stat. § 141-B:7.

¹³ N.H. Rev. Stat. § 141-B:9.

¹⁴ N.H. Rev. Stat. §§ 141-C:7; 141-C:8.

¹⁵ N.H. Rev. Stat. § 141-C:10.

¹⁶ *Id.*

¹⁷ N.H. Rev. Stat. §§ 141-H:1 through H:6.

¹⁸ N.H. Rev. Stat. § 141 H:1 (defining “genetic testing”).

¹⁹ N.H. Rev. Stat. § 141-H:2.

by appropriate professionals within a physician's medical practice or hospital is not a violation of this provision.²⁰ Additional strict limitations apply to insurers and employers.²¹ Anyone whose confidential genetic test information is disclosed in violation of the statute may bring a civil action and recover special or general damages of not less than \$1,000 per violation, costs and reasonable legal fees.²²

HIV: The results of an HIV test performed by a laboratory or the department of health may only be disclosed to the physician ordering the test or the person authorized by the physician, and the commissioner of health in certain circumstances.²³ The physician must disclose the test result to the person who was tested and must offer counseling.²⁴

Generally, the identity of a person tested for HIV may not be disclosed without the tested person's written authorization.²⁵ All records and any other information pertaining to a person's HIV test must be maintained by the department of health, a health care provider or any other entity, public or private, as confidential and protected from inadvertent or unwarranted intrusion.²⁶ If a person who has a positive test result is under 18 or is mentally incapable of understanding the ramifications of a positive test result, the physician may disclose the test result to a parent or guardian.²⁷ Furthermore, HIV-related information may be disclosed without the person's consent to other physicians and health care providers directly involved in the health care of the person when the disclosure is necessary to protect the health of the tested person.²⁸ This information may also be disclosed to a blood bank provided that the information remains confidential and protected. Anyone who purposely violates these provisions and discloses the identity of a person infected by HIV is liable to such person for actual damages, court costs and attorneys' fees, plus a civil penalty of up to \$5,000 for such disclosure.²⁹

Mental Health: Although a patient's communications with a mental health care provider are generally privileged, a community mental health center or state facility providing services to seriously or chronically mentally ill clients may disclose to a patient's family member certain information concerning the client, such as diagnosis, medications prescribed and possible manifestations that would result from failure to take the medication, if the family member lives with the client or provides direct care to the client.³⁰ The mental health center or facility must first notify the client of the specifics of the requested disclosure (including the name of the person requesting the information, the information requested and the reasons for the request), and attempt to obtain the client's written consent. If consent cannot be obtained, the mental health center or facility may still disclose the information but must inform the client of the reason for the intended disclosure, the specific information to be released and the person(s) to whom the disclosure is to be made. When a patient has been involuntarily admitted, a mental health facility may request and a health provider may furnish specified information about the patient (such as medications prescribed) essential to the medical or psychiatric care of the person admitted. The facility

²⁰ *Id.*

²¹ N.H. Rev. Stat. § 141-H:3.

²² N.H. Rev. Stat. § 141-H:6.

²³ N.H. Rev. Stat. § 141-F:7.

²⁴ *Id.*

²⁵ N.H. Rev. Stat. §§ 141-F:7; 141-F:8.

²⁶ N.H. Rev. Stat. § 141-F:8.

²⁷ N.H. Rev. Stat. § 141-F:7.

²⁸ N.H. Rev. Stat. § 141-F:8.

²⁹ N.H. Rev. Stat. § 141-F:10.

³⁰ N.H. Rev. Stat. § 135-C:19-a.

must attempt to obtain the client's consent prior to requesting such information, but may request it, if necessary, absent the consent. The facility may disclose such information as is necessary to identify the person and the requesting facility.³¹

Substance Abuse: Reports or records on any client of a certified alcohol or drug abuse treatment facility may only be used for rehabilitation, research, statistical or medical purposes without the client's written consent. Information about the client is not discoverable by the state in any criminal prosecution.³² In addition, alcohol and other drug abuse professionals may not disclose information that was acquired from clients or persons consulting with the professionals in the course of rendering professional services.

Laboratory Test Results

Under NH law, clinical laboratory test results are subject to patients' rights of access (*i.e.*, to inspect and obtain a copy of them.)³³ Clinical laboratories may release test results to the provider who ordered the test as well to as the patient. However, laboratories may not release test results to any others, including providers, without the written permission of the patient.³⁴

Discussion of NH Provisions Specifically Applicable to an HIE entity

Under existing NH law, the HIE entity cannot be used for a number of purposes or capabilities. Specifically, the HIE entity cannot be used:

- For giving patients access to their medical records (HITECH expands requirements for providers to make medical records available to patients electronically, but the HIE law prevents the HIE entity from making such transmissions)
- For public health data transmissions to the state (such transmissions are mandated by other NH law, but the HIE law prevents the HIE ENTITY from making such transmissions)
- For transferring specified quality, safety, cost-effectiveness, and other Healthcare Operations data to CMS (Eligible Providers and hospitals must make certain data transmissions to CMS in order to be eligible for Meaningful Use stimulus payments, but the HIE law prevents the HIE Entity from making such reports)

We determined that Phase I of the HIEPI Plan would include only elements that can be accomplished under existing state law. Accordingly, under Phase I, the HIO will create a simple network where participating Covered Entities can send (*i.e.*, "push") PHI from a sender to a recipient. They will be able to do so only (a) among providers, and (b) for treatment purposes. No transmissions of PHI for payment, operations, public health, or patient access may occur. The security and privacy of medical data transmissions will be significantly improved over current practice as highly error-prone human and fax processes are replaced by secure, encrypted, and auditable electronic exchanges among authenticated providers.

As under current law, the obligation to determine if the sender has the legal authority to send the PHI, including all applicable federal and state consent and identity authentication requirements, will rest entirely on the sending provider under Phase I.

³¹ *Id.*

³² N.H. Rev. Stat. § 172:8-a.

³³ N.H. Code Admin. R. He-P 808.14(i) (2008) and N.H. Rev. Stat. § 151:21(X) (2008).

³⁴ N.H. Code Admin. R. He-P 808.14(j) (2008)(available at <http://www.dhhs.state.nh.us/NR/rdonlyres/e6mrdnkwkka3svhyenu2slbs736r5ng2gg5tinle4mq2kvre3ro5wu4mq3gf bek6osvpa2727g74mpidnxjnrmwyd/He-P+808+Laboratories+and+Laboratory+Services+Rules.pdf>).

In Phase I, the state audit requirement for an HIE entity will be met by the HIO as follows: the HIO will maintain audit logs that indicate: the fact that a data transmission took place, the sender, the recipient, the date and time, and technical information about the transmission itself. This will facilitate routine audit, as well as forensic examination if questions about the transmission are raised. In Phase I, however, the HIO will not keep any records about the identity of the patient or the contents of the medical record transmitted, for the HIO will not have access to any information about such. The HIO will act entirely as a carrier, moving medical information in accordance with the sending instructions, and it will be fully subject to audit only for the information it can actually access.

Phase II and III: As stated, existing NH law limits use of the HIO to data movements among providers and for treatment purposes only. Potential future expansions of the HIO have been discussed at length by HIEPI stakeholders and conversations are expected to continue in the General Court and with the public. Potential near-term expansions include (a) using the HIO to securely transport public health data that providers are already required to send to public health authorities, and (b) using the HIO to securely transmit to CMS and NH Medicaid the quality, safety, and other data required for providers to meet meaningful use criteria and qualify for incentive payments. Looking considerably further ahead, we also discussed legal issues raised by possible major enhancements that would be far more legally and technically complex, including using the HIO to facilitate patient access to their own health information, creating a query/pull model whereby providers could seek data needed to care for patients, a community record model, and interstate exchange issues. All of these expansions would require a change in NH statutes to be implemented as well as agreement among the stakeholders that such expansion would provide enough value to justify the increases in cost, complexity, and risk.

Recommendations for Legislation, Policy Change, and Future Analysis of Alternatives

In the near term we recommend the following items for consideration by the General Court regarding New Hampshire's policy framework for health information exchange:

- Enactment of statutory authorization for the HIO to be a public instrumentality, in accordance with the Governance recommendations
- Expansion of the existing HIE law to permit the HIO to be used by providers to make their mandatory public health reports in a more secure and private method than is possible under today's methods involving paper, fax, and manual data re-entry
- Increasing the privacy and security of public health reporting overall by having DHHS conduct a review of the degree of identifiability of data needed for particular purposes. Specifically, we recommend that DHHS analyze the data currently being received for public health purposes and classify whether each data set is needed (a) fully identifiable, (b) de-identified (per HIPAA definition), (c) in Limited Data Set format (per HIPAA definition), or (d) other (*i.e.*, certain direct identifiers removed but not qualifying as a Limited Data Set.) Either directly or through EHR interfaces, the HIO could then implement the new requirements for decreased identifiability by removing specified identifiers from structured data sets for public health purposes, thereby significantly reducing the risk of data breaches and enhancing patient privacy. DHHS should analyze whether any regulatory or statutory changes are needed to facilitate this process.
- Further analysis by the HIEPI and other stakeholders, including legislators, of the legal, technical, and practical implications of expanding HIO functionality to include submitting reports of quality, safety, and other data to CMS, in order to enable providers to use a secure means of making the data submissions needed for Meaningful Use stimulus payments. As this analysis is conducted, and more detailed information regarding these data submissions becomes available

from CMS, it may be appropriate for the General Court to amend the existing HIE law to accommodate such submissions.

In the longer term, NH may choose to expand the functionality of the HIO further by adding patient access capabilities, a pull/query system for providers to access records about the patients under their care, a community record accessing or aggregating patient-level data, and/or an expanded interstate exchange capability. Whether such becomes advisable will depend on numerous developments that will become more apparent over time. A number of legal issues would need to be addressed for such potential functionalities including:

- More complex and advanced internal security and privacy management systems, procedures, and controls if, in the future, patient access capabilities, a physician pull/query mechanism and/or community record management were to be introduced. Highly robust, accurate, and secure authentication and identity management capabilities would be among the controls needed.
- Resolution of differences in practices and interpretation regarding consent required for sharing records for treatment purposes, with statutory clarification, if needed.
- Statutory clarification of the nature of the HIO opt-out, including whether a patient opts out of the HIO as a whole or on a provider-by-provider basis (which enhances patient control but magnifies the risk of fraud and prescription drug abuse, and incomplete records being available to providers)
- Review and analysis of condition-specific consent requirements, with consideration given to similar work being undertaken in other states and nationally.

Policies and Procedures

The development of policies and procedures will be driven by HIO operational requirements, with additional policies and procedures added if the HIO adds new capabilities in later phases. The Executive Director of the HIO will be responsible for developing, implementing, monitoring, enforcing, and revising the policies and procedures. The Executive Director will (a) conduct a HIPAA Security Rule risk assessment and risk mitigation program, (b) ensure and document compliance with each of the 41 Security Rule implementation specifications, and (c) develop an Incident Response Plan with assigned responsibilities, before any live patient data is deployed, and on an ongoing basis thereafter. Testing and software development may not use actual PHI. PHI in transmission through the HIO will be encrypted according to contemporary NIST standards applicable in the HIPAA breach notification rule. Where consent is required, up-to-date technology that provides for granular and dynamic consent appropriate to the setting will be deployed. The Executive Director will implement and enforce training for compliance with the Security Rule and all internal policies and procedures.

Enabling Interstate Exchange

We have taken preliminary steps to review the status and design for HIE in neighboring states. Interstate exchange with neighboring states using the push method, whereby a provider sends records individually to a designated provider for treatment purposes, is being reviewed and is expected to be viable in Phase I in the relatively near term, and subject to technical constraints and HIO operational policies. If development of a query/pull mechanism is pursued in the future, NH will monitor and give consideration to any potential consensus being developed in the national arena regarding legal harmonization steps that could facilitate this type of interstate exchange. We have had discussions with the prominent HIE activities in each of the neighboring states and note that there are considerable differences among them that will pose non-trivial challenges not only for the option of leveraging existing infrastructure to support our statewide HIE needs, but also for regional integration going forward.

Trust Agreements

We intend to create a multi-stakeholder task force to draft a master Trust Agreement that includes Business Associate Agreement provisions as well as provisions customized to the HIO setting. The task force will consider Trust Agreements available from other states and federal sources as it drafts NH's Trust Agreement. Each provider participating in the HIO will have to execute the master Trust Agreement in order to participate and individual modifications will not be permitted so a high level of collaboration and consensus will be required in the drafting process. As issues arise in the future that indicate that the Trust Agreement needs to be modified, the Executive Director will reconvene a task force to consider recommendations and, where appropriate, develop a revised Trust Agreement for use by all participants.

Oversight of Information Exchange and Enforcement

Oversight and enforcement functions will be the responsibility of HIO governance, which will carry out any future design requirements of the General Court and will be responsible for developing oversight and enforcement policies. Provisions regarding compliance and enforcement will be included in the master Trust Agreement.

Operational Plan

Introduction

New Hampshire's operational plan begins the conversation regarding how the state will execute the strategy described in detail within the strategic plan. Per New Hampshire's Cooperative Agreement with ONC and the Program Information Notice, this part of the plan identifies how we will support the State's eligible hospitals and providers seeking to meet stage 1 meaningful use requirements and how we will use federal funds to address the gaps identified in the environmental scan.

As described earlier, the stakeholder representatives that drafted this plan will continue to share ideas with stakeholders throughout the State in order to build broad consensus on strategic direction. Given this commitment to our multi-stakeholder consensus building planning process, we will remain open to directional changes in the strategy. Therefore, the operational plan drafted below should be considered with the knowledge that operational design and operations recommendations are for continued discussion and lively debate with the goal of achieving a broad base of support for our State's health information exchange solution.

The Operational Plan mirrors much of the structure of the Strategic Plan with the following sections:

- Coordination sections to define how the State's many HIE and HIT initiatives will work together
 - OP-1 Coordinate with ARRA Programs Summary
 - OP-2 Coordinate with Other States Summary
- Domain specific sections to define the details of how the various components of the strategic plan will be executed:
 - OP-3.1 Governance
 - OP-3.2 Sustainability
 - OP-3.3 Architecture and Standards
 - OP-3.4 Services and Operations
 - OP-3.5 Privacy and Security
- Project Management Plan to define concrete steps for implementation
- Risk Assessment to define a prioritized set of program risks and mitigation strategies

OP-1 Coordinate with ARRA Programs Summary

As described in the strategic plan, we are committed to collaboration between leaders in order to better address shared interests and goals and to avoid duplication and waste. Fortunately, the community of leaders addressing HIT and HIE in New Hampshire is well established and practiced in collaboration. There are multiple well established entities within the State that are committed to facilitating information sharing and collaboration including the following among others:

- Bi-State Primary Care Association
- New Hampshire Area Health Education Centers
- New Hampshire Department of Health and Human Services which encompasses:
 - Office of Medicaid Business and Policy

- Office for Health Information Technology - State HIT Coordinator
- Division for Public Health Services
- New Hampshire Hospital Association
- New Hampshire General Court
- New Hampshire Medical Society
- North Country Health Consortium
- University of New Hampshire

As we close the first round of intense strategic and operational planning, we can also add the HIEPI project workgroups to the list of successful collaboration bodies. Our intention is to continue cultivate the rich ideas and energy of the collaborative networks of leaders within the state in order to facilitate HIT and HIE activities. We will also benefit from the HITECH programs as they bring federal funding and direction and we intend to manage these programs in synchrony:

- Health Information Exchange Planning and Implementation project
- Prospective Regional Extension Center Program
- Workforce development Program
- Broadband Program
- Beacon Community Program (note: we will continue to reach to the Bangor and Rhode Island Beacon Communities to identify shared regional initiatives)

We recognize that collaborative activities occur most effectively when supported by shared and neutral capabilities for group facilitation, administrative, communication, and project management. Therefore, the HIO will take responsibility for supporting collaborative activities surrounding HIT and HIE. As mentioned earlier, the HIO will initially be led by the State HIT Coordinator supported by the Office of Health Information Technology (OHIT) and contracted staff with eventual transfer of the HIO to a newly formed organization. HIO collaboration support responsibilities specifically include planning and management for regular cross-organizational meetings, facilitation of ongoing multi-stakeholder workgroup activities, and regular communication of pertinent information. In the month following submission of the SOP to ONC, the HIEPI stakeholder representatives will define the next phase of workgroup activity and resume facilitated planning meetings.

OP-2 Coordinate with Other States Summary

Coordination with Other States

New Hampshire has already begun coordination efforts with neighboring States. We recognize that this is essential if we are to address the issues that currently arise as patients cross New Hampshire's borders to seek care. We also recognize that these cross border issues will become more pronounced as each individual state advances its capabilities for HIT and HIE and hospitals and providers become more reliant upon electronic health information.

We are relying on the development of shared architecture, standards, policies, and procedures of the Nationwide Health Information Network (NHIN) to enable the NHIN's state to state, "network of networks" design. We intend to inform the continued development of NHIN along with leaders from our neighboring states. It is also in our best interest, as a state with large volumes of cross-border care delivery, to stay aligned with NHIN as we develop our own HIO and HIE infrastructure.

The following points of coordination have been established and will continue moving forward:

Coordination with Vermont: We have met multiple times with the leadership of the Vermont Information Technology Leaders, Inc. (VITL), the State Designated Entity that is responsible for HIE in Vermont. We have seen an overview of VITL's capabilities and have begun discussions regarding collaboration to best serve residents and providers that are crossing the Connecticut River to seek and provide care. Collaboration with Vermont is also being orchestrated by ONC through meetings among State HIT Coordinators and leaders of the various ONC grant programs.

Coordination with Maine: We have met multiple times with the leadership of the Maine HealthInfoNet, the State Designated Entity that is responsible for HIE in Maine. We have seen an overview of Maine HealthInfoNet's capabilities and have begun discussions regarding cross-border information exchange similar to the discussions held with VITL. Maine leaders also participate in ONC collaboration activities so the NH State HIT Coordinator and several other leaders are able to meet with Maine's representatives regularly.

Coordination with Massachusetts: We have met with the leadership of the Massachusetts eHealth Institute (MeHI), the State Designated Entity responsible for development of the Massachusetts strategic and operational plans, to begin discussions regarding cross-border information exchange. Collaboration with Massachusetts is also being orchestrated by ONC through meetings among State HIT Coordinators and leaders of the various ONC grant programs.

Coordination with New England Leaders: In addition to meeting with leaders from the individual states, we have met with leaders that are thinking about HIE in terms of a New England regional effort. The State HIT Coordinator is involved in region wide infrastructure planning as a part of the New England States Consortium Systems Organization (NESCSO). We have also met with the leadership of the New England Healthcare Exchange Network (NEHEN), a functioning HIE operating in Massachusetts and Rhode Island. We have seen an overview of NEHEN's capabilities and have begun discussions regarding collaboration.

As with our other points of coordination, we recognize that collaborative activities occur most effectively when supported. Therefore, the State HIT Coordinator will be the point of collaboration between New Hampshire, its neighbors, and the New England States more broadly. To support coordination activities, the HIO will take responsibility for planning and management for regular cross-state meetings and regular communication of pertinent information to other stakeholders.

OP-3.1 Governance

Stakeholder Engagement, Representation, and Roles

As part of the planning process, the HIEPI project has engaged stakeholders from all relevant stakeholder groups and has involved these stakeholders in the planning process through a representative democracy. This process has worked well throughout the planning stages and stakeholder representatives would like to see multi-stakeholder collaboration continue.

As mentioned in the strategic plan, a recommendation has been put forth to launch an entity that can facilitate cross organizational collaboration and that can launch and maintain a foundation of shared health information exchange infrastructure. We have recommended that this health information organization (HIO) take the form of a 501(c)(3) public instrumentality. The HIO will enable us to formally govern cross organizational health information exchange and ensure appropriate oversight from a wide range of stakeholder groups.

Launch of an HIO as public instrumentality requires the NH General Court to draft and pass legislation defining the organization and how it will be governed and operated. Therefore, our first task is to propose legislation in December of 2010 that may be considered in the next legislative session beginning in January of 2011. There are several State Legislators involved in the workgroup planning activities and we will support these leaders as they shepherd legislation through the State's policy making processes.

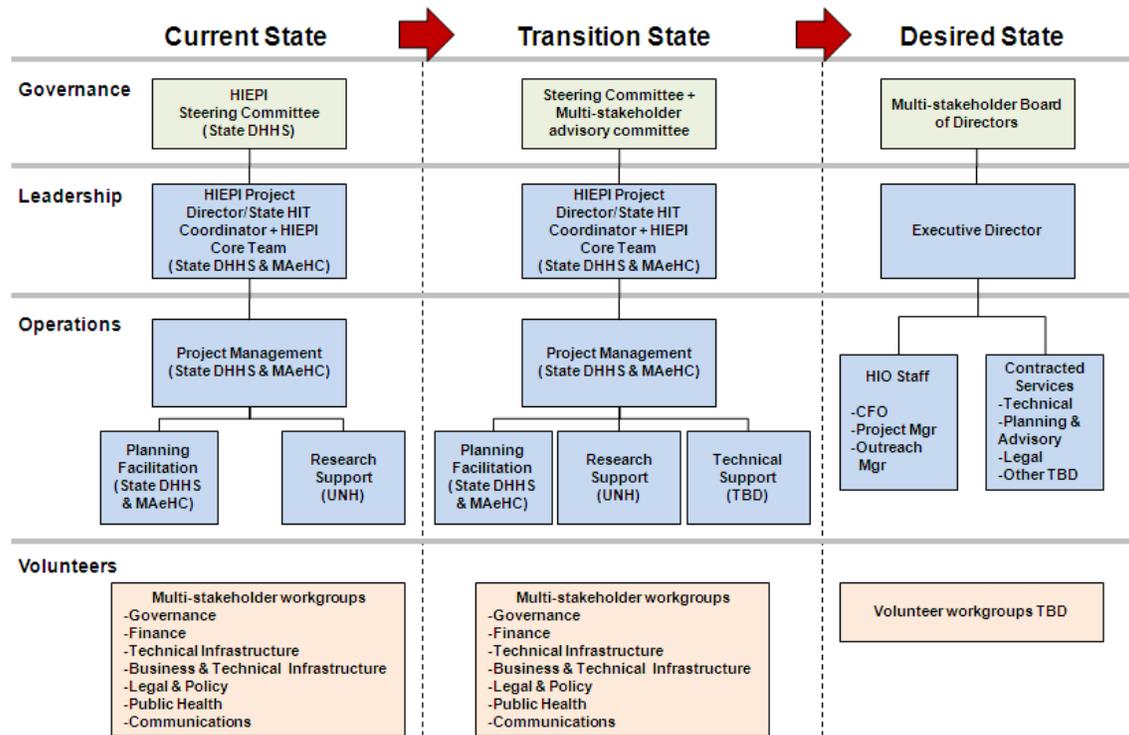
The General Court will ultimately determine the high level design of the HIO. We offer the General Court the following recommendations regarding organizational design:

- HIO governance structure should provide fair stakeholder representation
- Design of the HIO board structure, board functions, policies, process, and bylaws should be conducted with input from a multi-stakeholder advisory group
- Medicaid and Public Health representatives should be involved in design of HIO governance to ensure alignment of the HIEPI, Medicaid, and public health programs
- The HIO will be the neutral organization responsible for building consumer trust, facilitating cross-organizational collaboration, and providing the basic framework and "rules of engagement" for HIE – the HIO needs to be carefully designed to fulfill all of these roles
- Health information is still a fledgling market with an uncertain future – therefore, processes should be defined for regularly evaluating and updating HIO mission and mechanisms should be put in place for updating HIO design as required to meet the changing environment and evolving needs of stakeholders

Once the public instrumentality is defined by the General Court and signed into law, we will register a 501(c)(3) organization, recruit and hire operational management staff, recruit an initial board of directors and formally transfer the HIO role from NH DHHS Office of Health Information Technology to the new organization.

Since the public instrumentality will take some time to set up and launch, and there is much work to be done in the near term, we will operate the HIO within DHHS Office of Health Information Technology (OHIT) with an interim governance and operational structure. As illustrated in the diagram below, we will build upon our current HIEPI governance and operations structure in the transition period leading to the launch of the new HIO. This includes extension of the Steering Committee to involve representatives from other stakeholder groups. Processes and schedules will be defined to facilitate a smooth hand off of governance functions to the new HIO governance once formed.

Figure 24: Transitional Governance and Operations



The other activity that must occur in the transition is a smooth hand-off of HIO operations from DHHS OHIT to a new management team. This will occur through a series of transition meetings. There is an open question regarding the relationship between the DHHS OHIT and its current staff including the State HIT Coordinator and Project Manager. Since these positions are tied to project funding but are staffed through the State government, there is an open question regarding transition of staff that will be resolved in the coming months.

As discussed in the strategic plan, there is a chance that the General Court will not authorize the creation of a public instrumentality and that this presents a risk to the State’s providers’ abilities to meet meaningful use stage 1. Given the stage 1 meaningful use timelines, there is little room for delay in the launch of a HIO. Therefore, our contingency plan is to house the HIO within NH DHHS. This contingency plan will be executed within the 2011 legislative session (January – May 2011) if and when it becomes clear that the General Court will not authorize creation of a public instrumentality. Given this timing, we will have the transitional operations and governance structure in place as shown in Figure 24 above. The contingency plan will be to keep the transitional governance and operations structure in place and to go through a consensus process to formalize the multi-stakeholder governance function.

OP-3.2 Sustainability

Detailed cost estimate for implementation of HIO

Detailed cost estimates have been developed to guide planning efforts to date and to determine the bounds of what is feasible for the HIO to take on. Cost estimates are in two buckets. The first bucket includes estimated costs to a technical foundation in for secure routing among healthcare providers. The second bucket includes estimated costs to design, launch, and operate a new HIO. Preliminary cost estimates are shown below followed by detail on each line item.

Figure 25: Preliminary Cost Estimate

Item (Costs in \$000)	FFY '10	FFY '11	FFY '12	FFY '13	Total
	10/1/09 - 9/30/11	10/1/10 - 9/30/11	10/1/11 - 9/30/12	10/1/12 - 9/30/13	
Technical Foundation for Secure Routing among Providers					
Backbone Infrastructure	-	1,703	375	375	2,453
Security Infrastructure	-	100	-	-	100
Node Addressing Infrastructure	-	90	-	-	90
Provider Addressing Infrastructure	-	200	-	-	200
Audit Infrastructure	-	225	-	-	225
Node integration	-	350	450	600	1,400
HIE NHIN Gateway	-	-	-	50	50
Total Technical Foundation for Secure Routing among Providers	-	2,668	825	1,025	4,518
Design, Launch, and Operate HIE Organization					
Personnel Costs	110	376	533	547	1,566
Marketing & Communications	-	65	65	65	195
Travel	11	15	15	15	56
Equipment	6	6	6	6	24
Supplies	1	7	7	7	22
Contractual	422	778	400	400	2,000
Facilities	-	-	27	27	54
Indirect Costs (Statewide Cost Allocation)	3	198	96	107	404
Total Design, Launch, and Operate HIE Organization	552	1,444	1,149	1,174	4,320
Total	552	4,112	1,974	2,199	8,838

Technical Foundation for Secure Routing among Providers

Backbone Infrastructure: The backbone infrastructure estimate includes costs for assembling a basic technology platform for secure routing, development/enhancement of basic administrative tools for operations and reporting, and development of baseline architecture. The estimate encompasses integration work to adapt tools to meet the unique requirements of New Hampshire and any specialized transaction types. The estimate includes hosting setup, initial hardware procurement, redundancy, and professional management of a data center as well as helpdesk, incident management, and support services.

Security infrastructure: The security infrastructure estimate includes capabilities for identity proofing, certificate management, and credentialing services. (Note, this assumes delegation of end user credentialing to the organizations acting as HIE clusters.) The estimate also includes intrusion detection capabilities, firewalls, DMZ configuration (e.g., honey pot), monitoring, and local encryption.

Node Addressing Infrastructure: The node addressing estimate includes tools, custom development, and deployment of tools for administration of the HIE clusters which are the nodes on the network.

Provider Addressing Infrastructure: The provider addressing infrastructure estimate includes development of interfaces and schema to for a federated directory (assuming global addressing scheme like that contemplated by NHIN Direct) as well as custom development/adaptation and deployment of tools for administration of a provider directory. This includes an initial data load, initial addressing assignments, hardware, storage, and software.

Audit Infrastructure: The audit infrastructure estimate includes purchase of a commercial audit package with reporting and integration, integration services with the backbone architecture, and implementation costs to implement federated audit trail with automated integration including documentation, testing, development, and piloting.

Node integration: Node integration includes costs for connecting to HIE clusters. This estimate assumes that 13 HIE clusters will be connected that have advanced health IT capabilities along with another 10 HIE clusters that are less experienced or new. Costs include interfacing, training, hardware, networking, hosting, and implementation costs. The estimate does not include purchasing or altering edge systems, which will be the responsibility of each HIE cluster.

NHIN Gateway: The NHIN gateway estimate includes costs to NHIN Connect Gateway, conduct testing internally and externally, and integrate with the HIE backbone.

Design, launch, and operate HIO

Personnel Costs: This estimate includes salaries and fringe benefits for a core operations team. This team includes the current DHHS Office for Health Information Technology (OHIT) staff as well as new staff for the HIO, which will assume many of the OHIT functions once launched. Staffing includes the following positions and associated full time equivalents (FTEs):

- State HIT Coordinator (1 FTE) – position to remain with DHHS upon launch of HIO
- State Project Manager (1 FTE) – position will support both DHHS and HIO with placement of position to be decided
- HIO Executive Director & CIO (1 FTE) – position to be hired with launch of HIO
- HIO CFO (.5 FTE) – position to be hired with launch of HIO
- Outreach Manager (1 FTE) – position to be hired with launch of HIO

Marketing & Communications: This estimate includes costs for educating stakeholders and partners regarding HIE benefits, developing and executing new business relationships, patient outreach, provider outreach, and web development to support communications efforts.

Travel, Equipment, and Supplies: These items are self explanatory and cover the minimal overhead associated with running a small operation.

Contractual: This estimate includes current and anticipated costs for contractors. Contractors may be used to supplement capabilities of the staff and to bring deep subject matter expertise to different phases of the project. Contractors are expected to provide planning advisory support, research support, technical support, and legal counsel among other functions.

Facilities: This estimate includes office space rent and utilities.

Indirect Costs: This estimate is for indirect costs allocated across all State programs.

This budget will continue to be evaluated and honed through an ongoing collaborative process and adjusted based on additional commitments from supporting entities and modifications to the required infrastructure. To provide increased accuracy in budgeting, areas requiring additional information, such as budgeting for statewide HIE infrastructure will be modified through Requests for Information (RFI), industry insight from consulting partners, the use of similar statewide HIE initiatives as proxies, and continued cost-related research and modeling.

Staffing plan

The HIO will initially be staffed by DHHS OHIT staff with support from contractors and volunteers. OHIT staff includes the State HIT Coordinator and the OHIT Project Manager with oversight from a multi-department Core Team and Steering Committee. Contractors include teams from the University of New Hampshire and the Massachusetts eHealth Collaborative. Volunteers include the multi-stakeholder workgroups that were established for the HIEPI project in June 2010.

Assuming the passage of legislation to establish an HIO, a small team can be hired to take on all HIO functions supported by contractors where additional expertise is required. The HIO will likely include the following positions:

HIO Executive Director/Chief Information Officer: An Executive Director will lead all aspects of the HIO, will work closely with the governance board once established, and will serve a broad range of functions required to lead the HIO. The desired Executive Director will also wear the hat of CIO and should be capable of understanding and managing deployment and operations of a complex technical infrastructure. A full job description will be developed once the HIO is more clearly defined through the legislative process. If and when the HIO is approved by the General Court, an executive search will be conducted to identify and hire the Executive Director.

HIO Chief Financial Officer: A CFO will be a part time position responsible for managing the finances of the organization including the financial reporting required by the State and Federal governments for use of ARRA funds. The CFO will be responsible for setting up and overseeing management planning and control systems and to ensure all accounts are compliant with generally accepted accounting principles (GAAP), relevant Office of Management and Budget (OMB) circulars, and ARRA specific reporting requirements.

Outreach Manager: An Outreach Manager will be responsible for establishing partnerships with stakeholders throughout the State. This will include educating stakeholders on the benefits of the HIO, establishing contract relationships with stakeholders, and managing processes for on-boarding and ongoing services for each stakeholder.

Project Manager: A project manager will take responsibility for managing the day-to-day operations of the HIO. The Project Manager will draft project plans and schedules for the HIO's major initiatives and will take responsibility for ensuring that staff and contractors stay on track for delivery.

Financial management, reporting, and control

In accordance with FOA requirements, we will establish generally accepted accounting principles (GAAP) and Office of Management and Budget (OMB)-compliant financial reporting structure, policies, and procedures for the HIO. The State of New Hampshire DHHS is currently taking accountability for financial management, reporting, and control throughout the duration of the HIEPI project. If and when a

separate HIO is established in New Hampshire, the DHHS will maintain accountability for the project's financial management and will work closely with the new CFO and governance board of the HIO to meet all obligations.

Day-to-day financial management of the HIO is expected to be transferred from DHHS to the HIO once the HIO is established. Upon the conclusion of the federally funded HIEPI project, and with conclusion of DHHS's obligations under the FOA with ONC, full accountability for financial management, reporting, and control is expected to be transferred to the HIO in full.

OP-3.3 Architecture and Standards

Technical Approach

As previously mentioned, the secure routing platform will be a flexible and scalable standards-based enterprise infrastructure which will provide a robust, reliable and secure network that will be established according to the following principles:

1. **Leverage existing infrastructure:** Given the high penetration of localized health information exchange, we will leverage these existing HIE clusters as brokers for transactions; the HIO will be a network of existing and future HIE clusters which will allow these HIE clusters to exchange information for purposes of care coordination and other functions as prioritized by stakeholders.
2. **Lean Infrastructure providing value added services:** The HIO will create a backbone which can facilitate secure, inter-organization exchange via a statewide, standards-based integration platform (i.e., an enterprise service bus (ESB)) with the appropriate security (authentication, authorization, and encryption), privacy, auditing and access provisions as required by state and federal regulations.
3. **Implementation of National Standards:** The HIO will use nationally accepted and standards-based protocols for central exchange, in addition to those standards defined and required by HHS for content, vocabulary and security (discussed in Strategic Plan). Potential options are NHIN Direct that is currently under development at ONC and enables simplified directed exchange between two known endpoints, and the NHIN Specifications in use in the NHIN Exchange Limited Production Network that represent a more robust framework for interoperability and are currently being implemented by federal agencies. The state is leaning heavily towards SOAP as a transport protocol because of the richness of the SOAP envelope for housing meta-data that enables much greater network extensibility at much lower cost and complexity for deployed systems.
4. **Global Addressing:** The HIO will allow both local and global addressing of endpoints which will provide users with the ability to lookup authorized recipients by name and facility for accurate and appropriate message addressing; it will provide services to facilitate statewide exchange (e.g. a Master Provider Index) as well as provide the required directory services for it to function as the gateway to NHIN.

5. **Access to PHI:** There will be no access to and exposure of Protected Health Information (PHI) to the HIO in Phase 1, and in the future if such access and exposure is allowed it would only be in prescribed cases as determined and in a manner to be defined by law, policy, and governance.
6. **Brokered Chain of Trust:** Trusted relationships are vital for health information exchange to take place between organizations. This trust fabric will be structured and brokered by the HIO in coordination and conjunction with the local HIE clusters. A central certificate authority most likely will be used to perform HIE cluster identity proofing with a common infrastructure for the creation, management, distribution, use, storage, and revocation of digital certificates (X.509) as part of the necessary Public Key Infrastructure (PKI).
7. **Security and Encryption:** Transport Layer Security (TLS/SSL 3.0) will be used as a baseline of encryption of data in transit. Other encryption can be layered on when needed (e.g. encryption of data at rest) based on the Federal Information Processing Standards (FIPS) as defined by the National Institute of Standards and Technology (NIST).
8. **First PUSH, then PULL:** The initial phase of HIO will focus on the concept of data ‘PUSH’; where unsolicited Continuity of Care Documents (CCD) and HL7 2.5.x messages are routed via the HIO from a source to a known recipient. The HIO may evolve in latter phases and provide additional services (e.g. Record Locator Service (RLS)) to support data ‘PULL’. In Phase 1, an asynchronous ‘PULL’ is allowed through the pairing of complementary transactions: one that allows a request for clinical information and another that allows data to be sent to a requester in response. This ‘PULL’ would therefore be comprised of two ‘PUSH’ transactions.
9. **Patient Consent Management:** Responsibility for consent acquisition, capture and management will be federated to local brokers (HIE cluster level) and will not be enforced by the HIO.
10. **Data Integrity:** Acknowledgement of successful transactions sent to the initiator will be required to ensure transport integrity (ACK/NACK); implementation of national standards (e.g. SHA-1) to verify that data has not been altered in transit will be required by the HIO.
11. **State level vs. local level HIE:** Local transactions will continue to occur within each HIE cluster according to their local architectural and policy frameworks; the HIO will not require existing HIE clusters to modify their internal health information exchanges. Local exchanges will be provided with the HIO requirements and specifications as part of an implementation guide which will instruct them on how to connect to the HIO and conform to the established policies, procedures and exchange requirements. In addition, the HIO will coordinate, support and help align regional plans and ambitions for HIE as they develop over time.

HIE Service Delivery

Phase 1 of the HIEPI project will provide a platform whose core services are necessary to facilitate secure routing of data between existing private, local and regional HIE clusters. These services will include:

- Authoritative directories which will be web-enabled and support standards-based queries, including:
 - **Provider Addressing:** a federated directory of health care providers (e.g. Master Physician Index)

- **Node Addressing:** Healthcare Information Organization directory; NHIN Direct Health Information Service Provider (HISP) directory, etc.
- Responsibility for identity assurance and authentication services will be delegated to the federated HIE clusters; this coordination along with a centralized PKI service will facilitate compliance with relevant state and federal **privacy and security** requirements. They will include:
 - Ability to ensure the provider receiving the record is authorized and is who they claim to be and,
 - Ensure the provider sending the information is the authorized recipient of the information.
- **Secure Routing** (via a centralized integration and routing engine) of the following data:
 - Lab results between existing hospital networks (future phase may also include routing of lab orders)
 - Diagnostic Imaging/ Radiology reports (future phase may include routing of diagnostic images)
 - Emergency Department and hospital inpatient discharge summaries
 - Key clinical information which will be defined as part of the ongoing collaborative process.
- **Administration and Auditing:** We will provide the necessary administrative tools to support HIO operations, management and reporting. This will include logging and auditing capabilities of all transactions facilitated by the HIO.

Implementation of the Audit Trail and Node Authentication (ATNA) integration profile as defined by IHE will be considered as part of the HIO enterprise service bus architecture.

Future phases of the HIO could layer on additional services as required, to include, but not be limited to:

- **Enterprise Master Patient Index (EMPI):** A database which uniquely identifies and links the various identifiers for a patient who may exist in multiple organizations and is known by numerous proprietary IDs. This is a core functional requirement to support pulling of data and the centralized aggregation and merging of patient records.
- **Record Locator Service (RLS):** A critical component which will enable the location and subsequent aggregation of patient information that is distributed across several disparate sources of information (e.g. HIE clusters).
- **Data Aggregation Service:** This will enable the aggregation, normalization and access to a patient's health summary data which is sourced from the various HIE clusters bound together by the HIO.

Approach to HIE Cluster Readiness

As mentioned in the strategy, the NH strategy is reliant upon a base level of capability among the HIE clusters for enabling stage 1 meaningful use transactions, for meeting Program Information Notice requirements, and for connecting local HIE networks to a statewide network. To support HIE cluster readiness, we will undertake the following activities:

- **Assess the capabilities of prospective HIE clusters:** We will gather capability information from all prospective HIE clusters relative to meaningful use stage 1 criteria, Program Information

Notice requirements, and requirements for connecting local HIE networks to a statewide network through interview meetings and site visits. We will develop a standard assessment template to guide the assessments and will coordinate meetings and site visits with the outreach efforts of the Regional Extension Center of New Hampshire.

- **Identify capability gaps:** The output of the assessments will be identification of capability gaps relative to the baseline capabilities required for connecting to the statewide network.
- **Assist HIE clusters to create a roadmap for addressing capability gaps:** Based upon the capability gaps, we will work with HIE cluster leaders to create a roadmap for closing critical gaps.
- **Assist HIE clusters to connect with the statewide network:** We will help organizations execute upon their roadmaps by connecting organizations to resources, facilitating cross-organizational collaboration, and providing direct assistance to connect HIE clusters with the statewide network. Once a prospective HIE cluster can demonstrate adequate maturity of capabilities, we will work with the HIE cluster to integrate with the statewide network. This includes physical connection of the HIE cluster to the statewide network as well as integration of processes, policies, and procedures to ensure secure and standardized exchange of information between the HIE cluster and the other HIE clusters that are connected to the statewide network. HIE clusters will be required to test conformance with HHS-adopted standards and will be certified as HIE clusters once these tests are completed successfully. Integration activity between HIE clusters and the statewide network are covered under our current budget and we will work to coordinate with other programs to bring additional resources to bear.

Approach to Connecting Unaffiliated Providers

Independent physicians represent approximately 34% of the State’s total physicians. These providers are not affiliated with a hospital system, integrated delivery network, or other system that gives these providers access to robust health information exchange capabilities. Since our phase 1 architecture is a “hub of hubs” model, these independent physicians require a hub in order to participate.

We have discussed multiple options for aligning unaffiliated providers with robust HIE capabilities. The most favorable options are presented below and we are remaining open to additional options as we learn more about unaffiliated providers:

- **Option 1:** Unaffiliated providers can be encouraged to join an existing HIE cluster. This requires that an existing HIE cluster be willing to accept an unaffiliated provider and that the provider be willing to work with the HIE cluster. One variation of this option is to designate geographic territories and facilitate the alignment of unaffiliated providers with the HIE cluster(s) within a geography. A second variation is to facilitate the alignment of unaffiliated providers with an HIE cluster regardless of geography.
- **Option 2:** Unaffiliated providers can be encouraged to form new HIE clusters. This requires that unaffiliated providers organize themselves for the purpose of pooling resources for shared IT services. There are successful examples of this model within the state and the statewide HIE process can help facilitate formation of new HIE clusters.

We have discussed additional options in which unaffiliated providers connect directly to the statewide network. The direct options introduce significant levels of complexity and cost and are not possible within our current constraints.

Though this is an important part of our vision and one of our key strategies, we have not yet reached consensus on our approach to connecting unaffiliated providers. There are significant benefits and issues that come with each option and we require additional planning to figure this out. We have a consensus

process in place to continue to narrow our options and finalize our decision regarding approach. This process includes the following activities:

- **Identify unaffiliated providers:** We have begun work with the HIE clusters to identify the owned and affiliated providers in the State and the majority of this activity is complete. We plan to work with the Regional Extension Center of New Hampshire to identify the remaining unaffiliated providers.
- **Assess barriers to connecting these providers through existing or new HIE clusters:** We have heard anecdotal reasons for providers to remain independent and would like to test initial hypotheses to determine why some providers are not currently organized regarding health IT capabilities. This will be done through interviews and surveys. Identification of these barriers will inform how we attempt to connect unaffiliated providers.
- **Facilitate connection of these providers to an existing or new HIE cluster:** With an understanding of the barriers, we will select an option for connecting unaffiliated providers and then facilitate the process for connecting providers to existing HIE clusters and/or launch of new HIE clusters.

Approach to Standards and Support of Interoperability

As previously discussed in the Strategic plan, the HIO will be in **strict compliance with all national standards** as defined in the HITECH Act, the final Standards and Certification Criteria used to support the Final Rule on Meaningful Use (both stage 1 and future stages) for content, vocabulary as well as privacy and security. In addition, the HIO will obtain the requisite certification if and when a nationally accredited HIE certification program is offered. The state of NH will take advantage of this opportunity to provide leadership in establishing statewide standards and requirements for interoperability.

We will consider one or a combination of methods to support statewide interoperability via the HIO:

1. **Borrow:** HIO has already begun the process of investigating potential partnerships with existing local and regional Health Information Exchanges, to include those established in the neighboring states of Maine (HealthInfoNet), Vermont (VITL) and Massachusetts (NEHEN).
2. **Build:** HIO will explore the option of using market ready and available open sourced platforms and applications with the help of local talent to build upon any existing state infrastructure and custom develop the core services required to support our state.
3. **Buy:** There are several mature and commercially available technology solutions with associated services which could be procured using a state driven competitive process. Examples of vendors that provide such solutions include, but are not limited to: Medicity, Intersystems, dBMotion, GE eHealth, 3M, Initiate, etc.

These options will be considered in significant detail during the two stage technology evaluation and procurement process. We will first publish a Request for Information (RFI) to solicit information about any viable technologies or solutions which we could implement. Based on that information, we will publish a Request for Proposal (RFP) and complete an assessment of proposals received from mature HIE vendors and technology companies, and potentially from existing solutions such as local or regional HIOs who are operating and could provide the requisite functionality and services. Several evaluation and selection criteria will be used as part of this process, including but not limited to: budgetary constraints, legal and regulatory constraints, functional requirements as defined by the HIEPI project, extensibility and scalability, as well as privacy and security framework. We will ensure that chosen solutions are in or

will be in compliance with the standards published by the Secretary of the Department of Health and Human Services (HHS) and state regulations.

As stated in the Strategic Plan, the HIO will, as a matter of policy, require that all participating HIE clusters comply with and enforce the HITECH enhanced HIPAA privacy and security rules. This is addressed in more detail in section OP-3.5 (HIE Privacy and Security) of the operational plan. Current and future HIE clusters and provider organizations will be strongly encouraged to select only those vendors and implement only those technologies which either are currently compliant with or are pursuing a product development road map which commits them to comply with these standards and requirements.

As mentioned in the strategic plan, since the payload of health information will be “closed envelopes of personal health information” and will not be viewable by the HIO, we will be unable to monitor adherence to HHS-adopted interoperability standards within the HIO. Instead, our community of stakeholders will adopt, implement, adhere to, and enforce use of HHS-adopted standards through the following process:

- **HIE clusters will agree to use certified health IT systems within their networks:** The meaningful use program and the Regional Extension Center of New Hampshire both provide guidance for use of certified systems as well as significant incentives to encourage selection and implementation certified systems. We will work closely with these programs, as well as others, to ensure that all systems connecting to the statewide network are certified.
- **HIE clusters will adhere to HHS-adopted standards:** All HIE clusters will adhere to content, vocabulary and security standards for transactions that go through the statewide network. We will work with each HIE cluster to educate leaders on agreed to standards and associated policies and procedures for participation in the statewide network.
- **HIE clusters will be tested for standards conformance and will be certified prior to connection to the statewide network:** All HIE clusters will demonstrated adherence to content, vocabulary and security standards which will lead to certification once successful.
- **HIE clusters will enter into user agreements with the HIO:** A user agreement will be used to formalize the commitment of each HIE cluster to adhering to HHS-adopted standards.
- **HIE clusters will continue to adhere to HHS-adopted standards, will monitor each others’ transactions, and will commit to collaborative continuous improvement:** To encourage ongoing adherence to HHS-adopted interoperability standards, we will set up a process in which HIE clusters may flag issues they may be having with transactions coming from another HIE cluster. We will then facilitate joint problem solving sessions to resolve any issues that arise. We believe that this will be the most effective and efficient way to make each HIE cluster aware of the repercussions of their choices and actions and that this facilitated process will encourage convergence on a set of standards by all.

Protection of Privacy and Security

The HIO will follow and implement industry standard operational best practices to achieve a high level of availability, security and system integrity. These will include, but are not limited to implementing operational and management processes, systems and services for ensuring:

- fault tolerance (failover and system/network redundancy)
- data backup, offsite storage, and restoration
- disaster recovery and business continuity planning
- intrusion prevention, detection, and breach response and mitigation

The HIO will ensure the protection of patient privacy through various policies and procedures, to include:

- Federated policy of consent management
- Only authorized access to PHI within the HIO in Phase 1; as determined by the policy and governance process
- Logging and Auditing policies and procedures (e.g. ATNA)
- Implementation of industry best practices to ensure physical and network security of the HIO infrastructure; as well as continuous monitoring, improvement and maintenance of system and network health and security. Various options exist for hosting and operating the HIO ESB infrastructure, and these will be considered as part of the RFP procurement process.
- Node Authentication and Authorization (e.g. PKI)

Alignment with NHIN

As discussed in the Strategic Plan, one of the core principles of the HIO architecture is for it to serve as a gateway to the Nationwide Health Information Network (NHIN) Exchange for all providers in the state. Referencing section SP-8.1, sub-section *Facilitating Participation in NHIN* of this document: “Our Phase 1 model deploys a NHIN gateway immediately in order to facilitate NHIN Direct transactions as soon as the specifications are available and to lay the foundation for more comprehensive exchange in conjunction with our neighboring states either through participation in NHIN Exchange and utilization of NHIN Connect, or in alignment with future NHIN solutions as appropriate.”

Given the current maturity of the NHIN, we are currently remaining open to the NHIN Direct and NHIN Exchange models, though we favor the open source Connect platform as of now. We have a collaborative process in place to further evaluate alternatives in the coming months and to determine exactly how we will a NHIN gateway for NH.

OP-3.4 Services and Operations

The HIO’s mission is to help facilitate exchange of key health information. In the short term, this includes services to enable providers to meet stage 1 meaningful use criteria. In the long term, this includes stage 2 and stage 3 meaningful use and the other emerging needs of our stakeholders. The HIO will fulfill its mission in two ways:

1. The HIO will steward collaboration among our HIE stakeholder community to encourage exchange of key health information where viable technology options (existing HIE clusters) are in place and to encourage implementation of systems where there are currently gaps (new HIE clusters).
2. The HIO will help a statewide network services to bridge the HIE clusters.

Stewardship of Collaboration among New Hampshire’s HIE Stakeholders

Through New Hampshire’s HIE Strategic and Operational planning process, over 80 stakeholders engaged in a collaborative community of leaders working toward common ends. The stakeholders engaged in a process for raising and resolving difficult issues, for determining shared priorities, and for setting strategic direction for work that may be done together. The value of this collaborative process is not to be underestimated, for it provides a way for New Hampshire’s stakeholders to share ideas, learning, resources, and effort from the public, private, and civil sectors in order to implement infrastructure that benefits all New Hampshire’s patients and those that serve them. Therefore, a core service of the HIO is to continue to steward collaboration among New Hampshire’s HIE stakeholders.

Stewardship of collaboration requires that the HIO provide the following services:

- **Facilitation of multi-stakeholder planning process:** This includes engagement of stakeholders, facilitation of workgroup meetings, engagement of subject matter experts, coordination, communication, and administrative support. Ongoing planning efforts will include stakeholder community representatives to identify gaps in capabilities throughout the state relative to meaningful use (stage 1,2, and 3) and set a plan to address such gaps.
- **Training and Technical Assistance:** The HIO will collaborate closely with leaders of the other HIT and HIE programs in the state to share education, training, and technical assistance materials, tools, educational documentation, and best practices. Direct technical training for HIO participation will be developed and delivered by the HIO. Training and technical assistance will be specifically targeted to help providers meet meaningful use criteria.
- **HIE Cluster creation, certification, and coordination:** The HIO will provide services for assessing existing HIE clusters, assisting clusters to meet minimal requirements for connection to the statewide network, certification of the HIE clusters to acknowledge a base level of capability and commitment, and ongoing coordination with the clusters. The HIO will also provide a service for helping unaffiliated providers to join an existing HIE cluster or form a new HIE cluster.
- **Project management:** This entails a shared project management office that is empowered by stakeholders to manage an agreed to project management plan.
- **Coordination with other initiatives:** Though all stakeholders are expected to coordinate efforts with parallel initiatives, the HIO is accountable for a formal coordination function. To fulfill this service, the HIO will establish formal connections with the leadership of parallel initiatives (as described in the coordination sections of the strategic plan) and formal processes for engaging with these connection points regularly.
- **Communications:** The HIO will take responsibility for outreach to the HIO's stakeholders, customers, partners, and the general public. This includes regular messages to inform each constituency of the HIO's plans and progress against such plans.

A certified HIE cluster will be a health care organization or aggregator of organizations that is capable of fulfilling the technical, legal, policy, and procedural obligations defined by the consensus governance process of the HIO, and willing to enter a binding contract with the HIO. In addition to signing an agreement with the Statewide HIO, Qualified Organizations will need to integrate with and connect to the statewide HIE platform to access core technical infrastructure and services on behalf of its providers.

Some steps that might form part of an HIE cluster certification protocol might be:

- Policies requiring users within the cluster to formally adopt certified EHRs
- Verifying gateway connections
- Testing the registration of an audit record in a test transmission of each of the three Stage 1 exchange constructs
- Test the receipt of a transaction sent by a named originator. Define a "transaction" – composed, for example, of these segments:
 - Envelope sent
 - Transmission registered in audit log
 - Envelope received and 'processed' (understood by the receiving software)
 - Acknowledgement sent (pushed) back to the originator.

Statewide Network Services

As described throughout this plan, we intend to deploy a statewide network to facilitate exchange of health information between HIE clusters. This solution will enable New Hampshire's providers to meet stage 1 meaningful use criteria by exchanging structured lab results and patient care summaries among non-affiliated organizations. (note: e-prescribing is widely available in the market and will not be included in the statewide network.)

The phase 1 secure routing infrastructure requires services to address the following:

- Documentation of standards and implementation guides for HIE cluster connectivity and transactions to support phase 1 uses cases. NHIN Direct may cover this need if completed and available in market solutions. Otherwise, specifications will be developed compatible with anticipated NHIN Direct standards.
- Security infrastructure, specifically the deployment of a certificate provider to act as root Certificate Authority and manage PKI. Options will be evaluated including possible support from state government or the impact of leveraging neighboring state infrastructures.
- Provider/Facilities directories to enable global addressing so that any provider can send a secure message to any other provider. Dartmouth Hitchcock Medical Center currently supports a NH Provider Directory and discussions are underway as to whether this can be leveraged. There is also a New England states effort to develop a Regional Provider Directory that NH is involved in. This regional effort will be monitored for possible leverage as well.
- Secure routing to support push transactions identified in Phase 1 Use Cases. Secure routing will include support for transport encryption, digital signatures on messages, message routing, message delivery acknowledgement, and potentially, adapters for HIE clusters and optional format translation and validation
- Support infrastructure as needed including auditing and monitoring. Minimal support is needed for Phase 1 since PHI exposure is extremely limited.

Use of NHIN Protocols/Standards and State Level Shared Services

As referenced in the HIE Architecture and Standards section for NHIN, from a technology perspective, the NHIN Gateway is part of the Core Services of New Hampshire's HIE infrastructure. The HIO will connect according to the standards and specifications of NHIN.

The HIO leadership team will assess any statewide needs presented to them for shared services and repositories, such as Patient Services, Record Locator Services and Terminology Service.

Development and Implementation of Standard Operating Procedures

Documentation is a key operating factor in maintaining quality and facilitating systems support. In order to properly train and maintain skilled resources for the HIO, internal standard operating procedures (SOP) and other supporting documentation (e.g. Users, Management and Training Guides) will go through a rigorous document authoring and approval process, common to the field of instructional design. Other Standard Operating Procedure documents will be developed for participating providers and HIE clusters, with networking, security and privacy policies. Once approved, the document will be passed to the communications manager, who will brand, disseminate and store it in the state designated shared document repository for member access.

Updates for the SOP will be scheduled on an annual basis, or as-needed according to major changes in legal, policy or business/technical operating requirements.

Development and Use of Directories and Repositories

Phase 1 will be focused on basic secure routing between providers. In order to achieve accurate routing within a network of HIE clusters, a Master Provider Index is needed, which will use the provider's address to identify, match and properly route information to physicians across the state. The HIO will need to know if a provider has multiple practice locations with gateways to the HIO for information retrieval. A patient directory is not required for phase 1 and will not be developed.

OP-3.5 Privacy and Security

Privacy and Security Framework

The HIO will be subject to federal health privacy law, *i.e.*, the HIPAA Privacy and Security Rule, as well as a federal law governing the confidentiality of certain substance abuse records. HIPAA makes Protected Health Information (PHI) about patients available for treatment, payment, and health care operations, as defined, and available for other uses, such as research or marketing, only upon specific patient authorization. The HIO will be regulated as a Business Associate, thereby being subject to the Privacy and Security Rule as well as the terms of the Business Associate Agreement (a/k/a Trust Agreement) that the HIO must enter into with all participating Covered Entities that provide PHI to the HIO. The HIO will also be subject to specific NH medical privacy laws and the HIO statute.

In brief, the NH provisions regarding a state HIE entity include:

- An HIE is an entity established for the primary purpose of enabling and overseeing the exchange of PHI for clinical decision-making purposes.
- The HIE entity may operate on a regional, statewide, or multi-state basis.
- The HIE entity may be used to exchange and grant access to PHI **only to providers and only for treatment purposes**.
- The HIE entity must maintain an audit log of providers who access PHI, including the identity of the providers, the identity of the individuals whose PHI was accessed, the date of access, and the area of the record accessed.
- The HIE entity must be certified as compliant with nationally accepted interoperability standards and practices, once federal certification standards are established.
- Providers cannot be compelled to participate in a HIE entity as a condition of payment.
- Individuals must be given an opportunity to opt out of sharing their names, addresses, and PHI through the HIE entity

In brief, NH provisions regarding medical privacy include:

- Providers cannot reveal confidential communications or information without the consent of the patient, "unless provided for by law or by the need to protect the welfare of the individual or the public interest." Health care lawyers in the state take differing positions as to the meaning of this provision, resulting in inconsistent practices. Some providers follow HIPAA rules regarding consent, whereas others obtain written consent for every disclosure of information, even to other providers involved in treating the patient.
- Patients have a right to access a copy of their medical records held by providers or health care facility. (The federal law governing patient access rights is broader; where records are kept electronically, patients have a right to electronic copies of their records and to have them sent to a third party they designate.)

- Providers must report security breaches if they violate state-specific marketing and fundraising laws, in addition to the breach reporting required at the federal level.
- Patients have a private right of action for violations of unauthorized disclosures.
- Subject to certain exceptions, genetic test results cannot be disclosed without the subject’s prior written and informed consent.
- HIV test results may not be disclosed without the tested person’s written authorization. “All records and any other information related to a person’s HIV test” must be maintained by providers and any other entity, public or private, as confidential.
- Communications with mental health care providers are generally privileged. A mental health center or facility must, subject to certain narrow exceptions, follow a specified statutory process to seek written consent from patients prior to disclosures. The patient must be informed of the name of the person requesting the information, the information requested, and the reasons for the request when consent is sought. If consent cannot be obtained, the center or facility may still disclose the information, although the client must nonetheless be informed of these specifics.
- Alcohol and drug abuse professionals may not disclose information acquired from clients in the course of providing professional services. Reports or records on any client of a certified alcohol or drug abuse treatment facility may only be used for rehabilitation, research, statistical, or medical purposes without the client’s written consent.
- Clinical laboratories may release test results to the provider who ordered the test and to the patient. However, laboratories may not release test results to anyone else, including a provider involved in the patient’s care, without the written permission of the patient.

The HHS HIT Privacy and Security Framework

In addition to its duty to comply with federal and state law, the NH HIO will adhere to the principles outlined in the HHS HIT Privacy and Security Framework, as follows:

- a. Disclosure Limitation
 - i. Phase I - All disclosures will be limited to authorized providers and for treatment purposes only.
 - ii. Phases II and III - Disclosures will be permitted only in accordance with HIPAA, NH law, and written HIO policies and procedures. To the extent that additional disclosures become possible through the HIO, they will be permitted only where consent is specifically, clearly, and conspicuously provided by the affected individual. For example, once the capability is built, an individual might request that his medical records be sent to his Personal Health Record (PHR).
- b. Individual Access
 - i. Phase I – The HIO will not be used to provide individuals access to their medical records, for such is not permissible under existing NH law. Instead, as under the status quo, providers and other HIPAA Covered Entities will be responsible for giving patients access to their medical records, including providing them, or their designated recipients, with electronic copies of their electronic health records upon request, as required by HITECH.

- ii. Phases II and III - the HIO's functionality may be expanded to include giving patients, or their designated recipients, access to their electronic records, thus helping Eligible Providers and hospitals fulfill part of their Meaningful Use requirements for stimulus payments. The HIO will likely utilize the continuity of care record (CCR)³⁵ standard, which will further interoperability between EHRs and individuals' PHRs.
- c. Correction
- i. Under Phase I and Phase II, providers will remain responsible for having a process in place whereby patients can request annotations or correction of errors in their medical records kept by the Covered Entity. We do not anticipate using the HIO directly for error correction purposes in the foreseeable future. Once the patient access capability is deployed, however, the HIO can serve a valuable role in promoting safety and better outcomes by helping patients discover errors in their medical records themselves, so they can then seek corrections through their providers.
- d. Openness and Transparency
- i. The purpose, role, governance structure, and operating rules of the HIO will be transparent and readily available to the public through a variety of communication means.
 - ii. The HIO will oversee an initiative to plan and implement a strategy for public education for both consumers and providers. The public education will include: clarifying where and under what circumstances PHI will be moved using the exchange; a high-level summary of privacy and security controls, including encryption; explanation of the anticipated benefits to patients and providers from deployment of the exchange; and a clear and transparent explanation of the mechanics of the opt-out process, consistent with meaningful choice recommendations.
- e. Individual Choice
- i. Phase I – The process of obtaining requisite individual consent to the movement of medical information will be handled at the provider level, just as it is today. Providers will use their existing mechanisms for obtaining consent, typically paper HIPAA authorizations.
 - ii. Phase II and III – Once community records and record search capabilities are deployed, patient consent will need to be managed carefully to ensure compliance with law and to be transparent and consistent with meaningful choice recommendations. Patients will need to be well informed about the effects of their choices when provided the opportunity to opt-out of

³⁵ The CCR standard is a patient health summary standard. The CCR contains various sections such as patient demographics, insurance information, diagnosis and problem list, medications, allergies and care plan within the CCR schema. The CCR represent a "snapshot" of a patient's health data that can be useful or possibly lifesaving. The ASTM CCR standard is designed to permit easy creation by a physician using an electronic health record (EHR) system at the end of an encounter. The CCR standard utilizes XML as a data interchange format. A CCR can potentially be created, read and interpreted by any EHR or EMR software application. A CCR can also be exported in other formats, such as PDF.

A Continuity of Care Document (CCD) r1 is a HL7 CDA implementation of the Continuity of Care Record (CCR) and not a competing standard.

the HIO. Electronic consenting mechanisms will require highly accurate and secure patient identity authentication processes to prevent fraud and misuse.

- iii. Phase II and III – In circumstances where it is appropriate to provide patients with specific and granular choices, patients should also be afforded the opportunity to change their choices over time. For example, if a patient directs that records be sent to his PHR, or allows his records to be used in certain types of research, the patient should be able to use a dynamic consent mechanism to change his choice and govern such uses and disclosures of his records in the future.

f. Collection and Use

- i. Phase I – the HIO will not collect or use any PHI. PHI will be transmitted only at the request of the sending provider, once the provider has verified that it has the proper authority to send the data to the particular receiving provider.
- ii. Phase II and III – whether the HIO will “collect” PHI, as opposed to merely transmitting it upon request, is a design and governance question that will be resolved when the community record capabilities are being designed. “Use” of PHI by the HIO for its own purposes is not anticipated at any point.

g. Data Quality and Integrity

- i. Phase I - The HIO has limited ability to implement data quality and integrity safeguards for PHI, since the HIO will be transmitting closed “envelopes” of PHI without having access to the records contained. Quality control and audit mechanisms will be used to help verify the accuracy of the transmission itself, though not the contents of the records.
- ii. Phase II and III – More robust data integrity checking mechanisms can be employed, using methods such as checksums along with record metadata.

h. Safeguards

- i. A comprehensive HIPAA Security Rule compliance program will be completed before any live patient data is deployed, and on a regular basis thereafter.
- ii. The Security Rule compliance program will include risk assessment, risk mitigation, and implementation of all 41 implementation specifications, including policy and procedure development and training.
- iii. Security risk assessments and updates to security controls, including policies, procedures, and training, will occur annually, or more frequently as needed.
- iv. Encryption used for communicating patient Information through the HIO should utilize a FIPS 140-2 certified methodology. Certificate-based authentication controls should be used for Node Authentication.
- v. While no standardization as to format or content of information sent through the HIO is possible under Phase I, standardized messaging address formatting will be required.
- vi. An Incident Response Plan with assigned responsibilities will be developed before any live patient data is transmitted through the HIO and will be updated annually, or more frequently as needed.

- i. Accountability
 - i. HIO policies and procedures will outline internal accountability, including enforcement procedures.
 - ii. As more capabilities are added, the policies and the Trust Agreement will need to include potential consequences for noncompliance by participants.
 - iii. The HIO will maintain audit logs and undertake periodic audits of the transmissions it has performed. More robust auditing will be implemented as functionality is added.

Compliance with Federal and State Legal and Policy Requirements

Compliance with federal and state laws and policy requirements will be relatively simple for Phase I, given that PHI will be transmitted only on a “push” basis among providers, who remain responsible for compliance with applicable laws. Compliance, particularly with consent mechanisms for sensitive conditions, laboratory tests, and adolescent records will be far more challenging once community records and search mechanisms are deployed. Policies and procedures will require considerable analysis to ensure compliance.

Future Policies and Procedures Required to Enable Inter- and Intrastate Information Exchange

Future intrastate exchange will occur in accordance with federal and state law and evolving Trust Agreements and HIO policies and procedures, as discussed herein. Interstate exchange, however, will be significantly impeded by the HIE law, as well as by differing laws in NH and other states regarding consent requirements for sensitive conditions and treatment of adolescent records. Interstate exchange is not planned for Phase I, at least in the early stage, but the Director will initiate steps to determine what technical and legal steps would be required for interstate exchange. The technical analysis of difficulties presented by interstate exchange, especially with neighboring states, will help inform the state’s degree of effort to seek harmonization of state medical privacy laws. NH will also monitor and give consideration to any potential consensus being developed in the national arena regarding recommended legal harmonization steps that can facilitate interstate exchange.

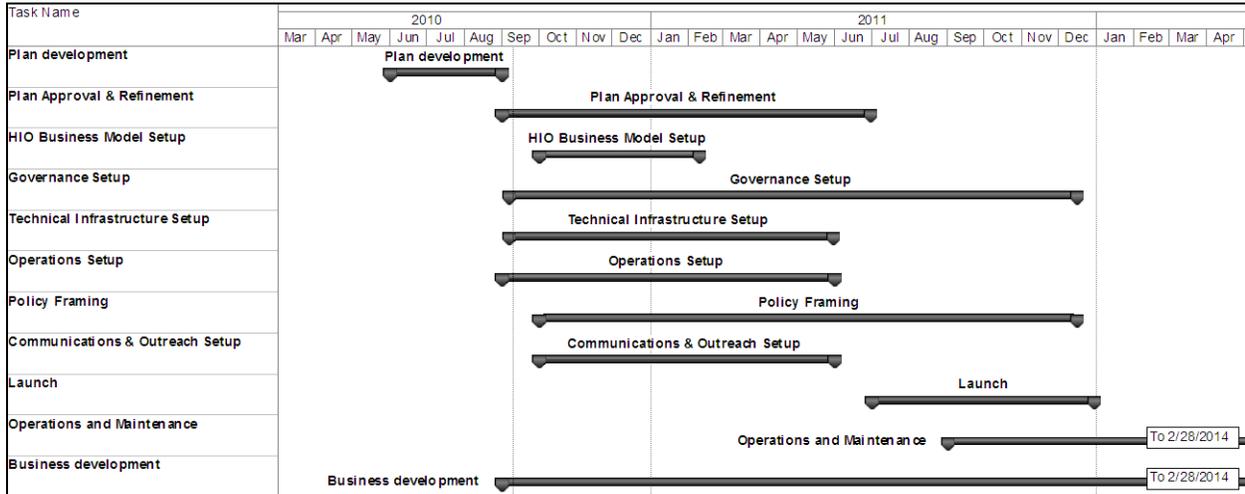
Special Provisions for Information Exchange with Federal Care Delivery Organizations

Information exchange with federal care delivery organizations such as the Veterans Administration will be an important future step that will be enabled through connection of the secure routing backbone with NHIN. The federal programs bring unique requirements that will require additional discussion and planning. We are in communications with the VA leadership and will continue to choreograph the VA and DoD efforts with the Virtual Lifetime Electronic Record with the NH HIEPI project.

OP-4 Project Management Plan

Note: This is an initial project plan to inform our overall planning process but still requires additional input and decisions from stakeholders to reach a full consensus-based plan.

The following Gantt Chart displays the overall plan through 2014.



Below is a more detailed plan for the program. Our business plan development and stakeholder engagement process will provide input for more detailed planning inputs between now and end of the calendar year 2010.

Phase	Task/Milestone	Start Date	End Date	Resource (By Team)
Plan Approval & Refinement	Plan Approval & Refinement Phase	9/1/2010	10/31/2010	
Plan Approval & Refinement	Respond to ONC inquiries and clarifications	9/1/2010	10/31/2010	Core Team, Workgroups, MAeHC
Plan Approval & Refinement	Respond to ONC requests for revisions	9/1/2010	10/31/2010	Core Team, Workgroups, MAeHC
Plan Approval & Refinement	Deliverable - ONC Approved Strategic and Operational Plan (v4)	10/31/2010	10/31/2010	Core Team, Workgroups, MAeHC
Plan Approval & Refinement	Facilitate dialogue with the general public to obtain broader input to the plan, suggested revisions, shared vision and goals, and broad stakeholder acceptance	10/1/2010	6/30/2011	Core Team, Workgroups, CMN Team, MAeHC
Plan Approval & Refinement	Address any outstanding items identified by the ONC or Steering Committee.	11/1/2010	6/30/2011	Core Team, Workgroups, MAeHC
Plan Approval & Refinement	Deliverable - Stakeholder Accepted Strategic and Operational Plan (v5)	6/30/2011	6/30/2011	Core Team, Workgroups, MAeHC
Setup phase		10/1/2010	6/30/2011	
HIO Business Model Setup Phase				
HIO Business Model Setup	Refine cost estimates with inputs from comparable plans, RFIs, and vendor quotes	10/1/2010	1/31/2011	Core Team, Finance WG, MAeHC
HIO Business Model Setup	Secure matching funds	10/1/2010	1/31/2011	Core Team, Finance WG, MAeHC
HIO Business Model Setup	Refine revenue model, structure, and details for collection including market testing with prospective customers.	10/1/2010	1/31/2011	Core Team, Finance WG, MAeHC
HIO Business Model Setup	Deliverable - Business Plan	2/10/2011	2/10/2011	Core Team, Finance WG, MAeHC

Governance Setup Phase				
HIO Governance Setup	Design and initiate interim governance body	10/1/2010	10/31/2010	Core Team, Governance WG, MAeHC
HIO Governance Setup	Prepare documents and information to support legislation proposal for creation of HIE public instrumentality	10/1/2010	12/1/2010	Core Team, Governance WG, MAeHC
HIO Governance Setup	Deliverable - File Legislation proposal for creation of HIE public instrumentality	12/1/2010	12/1/2010	Core Team, Governance WG, MAeHC
HIO Governance Setup	Hold public communication/update	12/1/2010	12/15/2010	Core Team, Governance WG, MAeHC
HIO Governance Setup	Ongoing communication with and education of stakeholders.	12/15/2011	6/30/2011	Core Team, Governance WG, MAeHC
HIO Governance Setup	Support Legislature to define HIO and its Governance including key functions, relationship with State DHHS, bylaws, board structure, appointment process, voting rights, etc...	12/1/2010	6/30/2011	Core Team, Governance WG, MAeHC
HIO Governance Setup	Upon passage of legislation, draft articles of incorporation and register 501(c)(3) entity	11/1/2010	6/30/2011	Core Team, Governance WG, MAeHC
HIO Governance Setup	Begin board appointment process	11/1/2010	6/30/2011	Core Team, Governance WG, MAeHC
Technical Infrastructure Setup Phase				
HIE Technical Infrastructure Setup	Conduct external validation	10/1/2010	10/30/2010	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Engage stakeholders to participate in technical solution selection process	10/1/2010	10/22/2010	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Draft and release RFI to gain information regarding industry solutions that may meet requirements	10/25/2010	11/30/2010	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Receive, synthesize, and review vendor responses responses	1/3/2011	1/14/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Discuss vendor responses and their impacts on the current operational plan - Share information with all other teams (e.g., Pricing Information).	1/17/2011	1/28/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Develop short list of prospective vendors	1/17/2011	1/28/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Draft and release RFP.	1/31/2011	2/18/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Refine technical budget for stakeholders	1/3/2011	2/18/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Receive, synthesize, and review vendor responses responses	3/14/2011	3/31/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Discuss vendor responses and their impacts on the current operational plan - Share information with all other teams (e.g., Pricing Information).	3/14/2011	3/31/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Choose vendor / partner	4/1/2011	4/1/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Execute Contract with Vendor	4/1/2011	4/29/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Deliverable - HIE Contractor Engaged	5/1/2011	5/1/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Develop HIE blueprint	5/1/2011	5/31/2011	Core Team, TI and Bus Ops WG, MAeHC
HIE Technical Infrastructure Setup	Deliverable - HIE Blueprint	5/31/2011	5/31/2011	Core Team, TI and Bus Ops WG, MAeHC
Operations Setup Phase				
HIO Operations Setup	Review next phase of work with Core Team, OHIT staff, and engaged contractors to determine roles, responsibilities, and expectations.	9/1/2010	9/30/2010	Core Team, MAeHC, UNH
HIO Operations Setup	Engage volunteer teams for setup phase.	10/1/2010	10/15/2010	Core Team, MAeHC
HIO Operations Setup	Actively collaborate with all stakeholders and other HIT/HIE programs within the state	10/1/2010	6/1/2011	Core Team, MAeHC
HIO Operations Setup	Conduct outreach and education activities to recruit and on-board customers	10/1/2010	6/1/2011	Core Team, MAeHC
HIO Operations Setup	Continue collaboration with NHIN, VT, ME, MA.	10/1/2010	6/1/2011	Core Team, MAeHC

Policy Framing Phase				
Policy Framing	Identify, propose, and reach consensus on recommended changes in NH HIE law to facilitate HIE.	10/1/2010	12/1/2011	Core Team, LP WG, MAeHC
Policy Framing	Public health reporting through HIE	10/1/2010	12/1/2011	Core Team, LP WG, MAeHC
Policy Framing	Patient access provisions	10/1/2010	12/1/2011	Core Team, LP WG, MAeHC
Policy Framing	Use of HIE for quality measurement and reporting (e.g., Meaningful Use reporting to CMS)	10/1/2010	12/1/2011	Core Team, LP WG, MAeHC
Policy Framing	Clarification of existing ambiguities in NH law re: consent that currently result in wasted legal resources, legal exposure, and inconsistent practices; liability limitations for providers; determination of whether opt-out applies to HIE participation as a whole or is applied provider-by-provider; and audit log clarifications.	10/1/2010	12/1/2011	Core Team, LP WG, MAeHC, NH Policy Makers
Policy Framing	Deliverable - File Legislation proposals	12/1/2010	12/1/2010	Core Team, LP WG, MAeHC, NH Policy Makers
Policy Framing	Hold public communication/update	12/1/2010	12/15/2010	Core Team, LP WG, MAeHC, NH Policy Makers
Policy Framing	Ongoing communication with and education of stakeholders.	12/15/2011	6/30/2011	Core Team, LP WG, MAeHC, NH Policy Makers
Policy Framing	Draft internal policies and procedures for HIE privacy, security, operations, data breach, etc.	12/15/2010	6/30/2011	Core Team, LP WG, MAeHC
Policy Framing	Deliverable - Updated Policy Framework	6/30/2011	6/30/2011	NH Policy Makers
Policy Framing	Deliverable - Policies and Procedures for HIE Privacy and Security	6/30/2011	6/30/2011	Core Team, LP WG, MAeHC
Communications & Outreach Setup Phase				
Communications & Outreach Setup	Support communications needs for all HIE initiatives throughout setup phase	10/1/2010	6/1/2011	CMC WG
Communications & Outreach Setup	Draft Communications Plan	10/1/2010	12/15/2010	CMC WG
Communications & Outreach Setup	Deliverable - Communications Plan	12/15/2010	12/15/2010	CMC WG
Launch Phase				
HIO Launch	Appoint HIO Board of Directors	7/1/2011	9/30/2011	TBD
HIO Launch	Complete search for HIO executive director and all staff.	7/1/2011	9/30/2011	TBD
HIO Launch	Complete formal handoff of responsibilities from DHHS to HIO	7/1/2011	9/30/2011	TBD
HIO Launch	Launch HIO	9/30/2011	9/30/2011	HIO
HIO Launch	Stand up all HIO capabilities	10/1/2011	12/30/2011	HIO
HIO Launch	Deploy Technology Infrastructure	10/1/2011	TBD	HIO, Vendor
HIO Launch	Recruit and on-board customers including execution of contracts, trust agreements, and agreed payment terms	10/1/2011	TBD	HIO
HIO Launch	Continue collaborative planning for future capabilities	10/1/2011	TBD	HIO
Ongoing Operations Phase				
Operations & maintenance	Ongoing operations and support	9/1/2011	2/28/2014	HIO, Vendor
Business development	Stakeholder engagement, current services expansion, future services identification and development	10/1/2011	2/28/2014	HIO

OP-5 Risk Assessment

Note: This is an initial risk assessment to inform our overall planning process but still requires additional input and decisions from stakeholders to reach a consensus-based assessment.

Risks and "Crux Issues"	Description	Severity	Probability	Prevention/ Mitigation Strategy
Funding resources may not be sufficient to match anticipated costs	Funding for even the basic infrastructure and establishment of a public instrumentality exceeds the Federal award and available state funding. Therefore the sustainability model depends heavily on outside sources of revenue or contributions. The HIO is largely unproven as a viable privately funded entity and stakeholder willingness to pay remains in question.	3. High	3. High	Develop business case for securing outside funding sources and contributions; evaluate and market test value propositions and revenue generation models. Proceed with incremental steps to build and prove value and to secure viable customer base before proceeding. Maintain extremely lean infrastructure and staff to minimize costs.
Policy framework constrains interstate data exchange	State law provisions (e.g., General consent policy; consent for movement of sensitive disease, adolescent, and lab records) conflict with provisions in neighboring states and impede interstate data exchange.	3. High	3. High	Recommend working with neighboring states and NHIN to identify and resolve misalignments in state policy frameworks that constrain interstate data exchange.
Policy Framework constrains use of HIE entity by several stakeholder groups and limits potential value	Current HIE law limits use of HIE entity to providers for purposes of healthcare delivery. This currently prohibits several high value transactions, limits HIE participation, and limits the potential value of the HIO overall.	3. High	3. High	Recommend changes in policy framework to the General Court for discussion, debate, and resolution in the 2011 legislative session.
Delay in engaging technology partner	There are many complexities associated with choosing and engaging a technology partner, whether it be a neighboring state's HIO, or a technology vendor. This introduces risk for schedule slippage, which in turn raises the amount of matching funds (given the ONC match schedule) the HIO must raise.	2. Med	2. Med	Pursue aggressive timeline to evaluate neighboring state infrastructures and to evaluate technology vendor solutions through an RFI and RFP process.
Delays in development of infrastructure by HIO and HIE clusters	Value generation is reliant upon connectivity of several organizations via the HIO and increases over time as more organizations are engaged. Any delay in standing up technology infrastructure and engaging customers is a risk to value generation and therefore to financial viability of the HIO.	2. Med	2. Med	Meet with majority of potential HIE clusters to determine readiness. Develop onboarding schedule that starts with pilot and beta tests and then moves to a standardized onboarding process.
Limited use of HIO by stakeholders	There is a risk of building an HIO and technology foundation that will not be widely used by stakeholders.	2. Med	2. Med	Involve potential customers throughout planning and design phases. Market test value propositions. Gain commitments from core customer base prior to making large investments. Identify and eliminate potential barriers to participation.

Appendices

Appendix A: HIEPI Representative Stakeholders

Stakeholder Group	Reps
Community Based Care	2
Community Health Centers	4
Community Mental Health Centers	1
Developmental Disabilities - Area Agencies	1
DHHS - BBH	4
DHHS - BDAS	1
DHHS - BDS	1
DHHS - BEAS	1
DHHS - DCYF	1
DHHS - DJJS	2
DHHS - Glenclyff	2
DHHS - HIPAA Privacy	1
DHHS - HIPAA Security	1
DHHS - Medicaid	1
DHHS - NHH	1
DHHS - OMH	1
DHHS - OOS	1
DHHS - Public Health	3
Employers	2
Health Plans	3
Hospitals - Large	11
Hospitals - Small	4
Medical Practices	2
Medical Practices - Advocate	1
NH Hospital Association	1
Nursing Homes	1
Patients / Consumers	7
Pharmacies	1
Physicians - Advocate	1
Physicians - CHC	1
Physicians - Hospital Affiliated	3
State - Governor's Office	1
State - DAS	1
State - DoIT	5
State - NH Corrections Department	0
State - NH State Legislature	4
State - NHID	2
VA - Hospitals	1
VA - Nursing Homes	1
VNA	1
	0
TOTAL	83

Appendix B: Glossary of Terms and Acronyms

All-Payer Claims Database: a database of medical, eligibility, provider, pharmacy, and dental claims encompassing fully-insured, self-insured, Medicare, and Medicaid data.

American Recovery and Reinvestment Act of 2009 (ARRA): a \$787.2 billion stimulus measure, signed by President Obama on February 17, 2009, that provides aid to states and cities, funding for transportation and infrastructure projects, expansion of the Medicaid program to cover more unemployed workers, health IT funding, and personal and business tax breaks, among other provisions designed to “stimulate” the economy.

Centers for Disease Control and Prevention (CDC): is a United States federal agency under the Department of Health and Human Services based in Atlanta, Georgia. It works to protect public health and safety by providing information to enhance health decisions, and it promotes health through partnerships with state health departments and other organizations.

Centers for Medicare and Medicaid Services (CMS): a federal agency within the United States Department of Health and Human Services that administers the Medicare program and works in partnership with state governments to administer Medicaid, the State Children’s Health Insurance Program (SCHIP), and health insurance portability standards.

Certification Commission for Health IT (CCHIT): a recognized certification body for electronic health records and their networks. It is an independent, voluntary, private-sector initiative, established by the American Health Information Management Association (AHIMA), the Health care Information and Management Systems Society (HIMSS), and The National Alliance for Health Information Technology (NAHIT).

Clinical Document Architecture (CDA): is an XML-based markup standard intended to specify the encoding, structure and semantics of clinical documents for exchange

Clinical Laboratory Improvements Amendments (CLIA): the CLIA Program sets standards and issues certificates for clinical laboratory testing.

Community Health Centers (CHC): health centers located across the United States that provide comprehensive primary care to 20 million Americans with limited financial resources. CHCs focus on meeting the basic health care needs of their respective communities, providing treatment regardless of an individual’s income or insurance coverage.

Computerized Physician Order Entry (CPOE): A computer application that allows a physician’s orders for diagnostic and treatment services (such as medications, laboratory, and other tests) to be entered electronically instead of being recorded on order sheets or prescription pads. The computer application may compare the order against standards for dosing, check for allergies or interactions with other medications, and warn the physician about potential problems.

Continuity of Care Document (CCD): specification is an XML-based markup standard intended to specify the encoding, structure and semantics of a patient summary clinical document for exchange.

Current Procedural Terminology (CPT): code set is maintained by the American Medical Association through the CPT Editorial Panel. The CPT code set accurately describes medical, surgical, and diagnostic services and is designed to communicate uniform information about medical services and procedures among physicians, coders, patients, accreditation organizations, and payers for administrative, financial, and analytical purposes. The current version is the CPT 2010.

Critical Access Hospital (CAH): is a hospital that is certified to receive cost-based reimbursement from Medicare. The reimbursement that CAHs receive is intended to improve their financial performance and thereby reduce hospital closures.

CVX: a code set used in the implementation of the HL7 standard for immunizations. The CDC's National Center of Immunization and Respiratory Diseases (NCIRD) maintain the HL7 external code set CVX.

Delivery Adaptor: in this case, technology adaptors enable heterogeneous edge systems to connect to the HIO. Transport and payload across the HIO is standardized to enable interoperability, but transport beyond the HIO to the final clinical system are likely to be variable (e.g., based upon Hospital Information System, a secure email system or another approach). A delivery adaptor is used to bridge between these heterogeneous systems and the standardized HIE transport and payloads.

Electronic Data Interchange (EDI): structured transmission of data between organizations by electronic means.

Electronic Health Record (EHR): As defined in the ARRA, an Electronic Health Record (EHR) means an electronic record of health-related information on an individual that includes patient demographic and clinical health information, such as medical histories and problem lists; and has the capacity to provide clinical decision support; to support physician order entry; to capture and query information relevant to health care quality; and to exchange electronic health information with, and integrate such information from other sources.

Enterprise Master Patient Index (EMPI): is an index referencing all patients known to an area, enterprise or organization. The terms **Patient Master Index (PMI)** and **Master Person Index** are used interchangeably.

E-Prescribing (eRx): A type of computer technology whereby physicians use handheld or personal computer devices to review drug and formulary coverage and to transmit prescriptions to a printer or to a local pharmacy. E-prescribing software can be integrated into existing clinical information systems to allow physician access to patient specific information to screen for drug interactions and allergies.

Federal Information Security Management Act of 2002 (FISMA): is a United States federal law enacted in 2002 as Title III of the E-Government Act of 2002. The act requires each federal agency to develop, document, and implement an agency-wide program to provide information security for the information and information systems that support the operations and assets of the agency, including those provided for or managed by another agency, contractor, or other source.

Federally Qualified Health Center (FQHC): safety-net providers such as community health centers, public housing centers, outpatient health programs funded by the Indian Health Service, and programs serving migrants and the homeless. FQHCs provide their services to all people regardless of ability to pay, and charge for services on a community board approved sliding-fee scale that is based on patients' family income and size. FQHCs are funded by the federal government under Section 330 of the Public Health Service Act.

Health Care Effectiveness Data and Information Set (HEDIS): is a widely used set of performance measures in the managed care industry, developed and maintained by the National Committee for Quality Assurance (NCQA). HEDIS was designed to allow consumers to compare health plan performance to other plans and to national or regional benchmarks.

Health information exchange (HIE) <verb>: In this plan, "health information exchange" refers to the act of sharing personal information among two or more parties (e.g., a hospital sending a discharge summary to a primary care provider). New Hampshire statute also refers specifically to a health information exchange in its noun form. This will be called an "HIE entity" in this plan and will be discussed in detail within the policy sections of the plan.

Health information organization (HIO) <noun>: In this plan, "HIO" refers to an organization and governance structure and the technical infrastructure that is responsible for facilitating private and secure exchange of health information among stakeholders from multiple organizations. The State does not currently have an HIO so the New Hampshire Department of Health and Human Services is taking the

HIO role in the interim. The General Court may consider legislation in 2011 to a new public/private organization to take the HIO role over the long term.

Health Insurance Portability and Accountability Act (HIPAA): enacted by Congress in 1996. Title I of HIPAA protects health insurance coverage for workers and their families when they change or lose their jobs. Title II of HIPAA, known as the administrative simplification (AS) provisions, requires the establishment of national standards for electronic health care transactions and national identifiers for providers, health insurance plans, and employers. The AS provisions also address the security and privacy of health data. The standards are meant to improve the efficiency and effectiveness of the nation's health care system by encouraging the widespread use of electronic data interchange.

Health Information for Economic and Clinical Health (HITECH) Act: collectively refers to the health information technology provisions included at Title XIII of Division A and Title IV of Division B of the ARRA.

Health Information Security and Privacy Collaboration (HISPC): was partnership consisting of a multi-disciplinary team of experts and the National Governor's Association (NGA). The HISPC worked with approximately 40 states or territorial governments to assess and develop plans to address variations in organization-level business policies and state laws that affect privacy and security practices which may pose challenges to interoperable health information exchange. RTI International, a private, nonprofit corporation, oversaw HISPC and was selected as the HHS contract recipient.

Health Information Technology (Health IT or HIT): As defined in the ARRA, Health Information Technology means hardware, software, integrated technologies or related licenses, intellectual property, upgrades, or packaged solutions sold as services that are designed for or support the use by health care entities or patients for the electronic creation, maintenance, access, or exchange of health information.

Health Information Technology Standards Panel (HITSP): A multi-stakeholder coordinating body designed to provide the process within which stakeholders identify, select, and harmonize standards for communicating and encouraging broad deployment and exchange of health care information throughout the health care spectrum. The Panel's processes are business process and use-case driven, with decision making based on the needs of all NHIN stakeholders. The Panel's activities are led by the American National Standards Institute (ANSI), a not-for-profit organization that has been coordinating the U.S. voluntary standardization system since 1918.

Health Information Trust Alliance (HITRUST): established the Common Security Framework (CSF), a certifiable framework that can be used by any and all organizations that create, access, store or exchange personal health and financial information.

HIE Cluster: In this plan, the term "HIE cluster" is used to describe an organization or group of organizations that have an advanced capability for exchanging health information. In New Hampshire, these HIE clusters are the large hospital systems, large practice organizations, and organizations that have aggregated several ambulatory practices or health centers for purposes of information exchange. "HIE cluster" synonyms include: Node, Hub, and Aggregator.

International Statistical Classification of Diseases and Related Health Problems (ICD-9/ICD-10): provides codes to classify diseases and a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or disease. Under this system, every health condition can be assigned to a unique category and given a code, up to six characters long.

Identity Access Management (IAM): involves people, processes, and products to identify and manage the data used in an information system to authenticate users and grant or deny access rights to data and system resources. The goal of IAM is to provide appropriate access to enterprise resources.

Individually Identifiable Health information (IIHI): information that is a subset of health information, including demographic information collected from an individual

Institute of Medicine (IOM): an independent, nonprofit organization that works outside of government to provide unbiased and authoritative advice to decision makers and the public.

International Organization for Standardization (ISO): is an international-standard-setting body composed of representatives from various national standards organizations. The organization disseminates worldwide proprietary industrial and commercial standards.

Logical Observation Identifiers Names and Codes (LOINC): is a database and universal standard for identifying medical laboratory observations.

Maine HealthInfoNet: HealthInfoNet is an independent, nonprofit organization advancing the meaningful use of health information technology to improve patient care quality and safety in Maine.

Massachusetts eHealth Collaborative (MAeHC): The Massachusetts eHealth Collaborative is the planning advisor engaged by NH DHHS to facilitate the multi-stakeholder HIE strategic and operational planning effort in NH.

Medicaid Information Technology Architecture (MITA): is an IT initiative intended to stimulate an integrated business and IT transformation affecting the Medicaid enterprise in all States. The MITA initiative's intention is to improve Medicaid program administration by establishing national guidelines for technologies and processes.

Medicaid Management Information Systems (MMIS): an integrated group of procedures and computer processing operations (subsystems) developed at the general design level to meet principal objectives.

National Institute of Standards and Technology (NIST): the non-regulatory federal agency within the United States Department of Commerce whose mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology. NIST oversees the NIST Laboratories, the Baldrige National Quality Program, the Hollings Manufacturing Extension Partnership, and the Technology Innovation Program.

New England Healthcare Exchange Network (NEHEN): collaborative of providers and payers in Massachusetts that created, manages and operates a shared electronic data exchange infrastructure.

New England States Consortium Systems Organization (NESCSCO): is a non-profit corporation organized by the six New England Health and Human services agencies and the University of Massachusetts Medical School. The mission of our organization is to foster communication and collaboration among members through information sharing and joint projects. NESCSCO's goal is to support the health and human services policy and system needs of the New England states by providing a framework for knowledge exchange in order to maximize policy, program and cost effectiveness.

New Hampshire Department of Health and Human Services (DHHS): The New Hampshire Department of Health and Human Services (DHHS) is the largest agency in New Hampshire state government, responsible for the health, safety and well being of the citizens of New Hampshire. DHHS provides services for individuals, children, families and seniors and administers such programs and services as mental health, developmental disability, substance abuse and public health.

New Hampshire Hospital Association (NHHA): Hospitals in New Hampshire have been collaborating in the public interest through the New Hampshire Hospital Association since 1934. NHHA's mission is to enhance the clinical and economic performance of hospitals, improve public confidence in hospitals, and expand access to coverage and care for the citizens of New Hampshire.

Office of the National Coordinator (ONC): serves as principal advisor to the Secretary of HHS on the development, application, and use of health information technology; coordinates HHS's health information technology policies and programs internally and with other relevant executive branch agencies; develops, maintains, and directs the implementation of HHS' strategic plan to guide the

nationwide implementation of interoperable health information technology in both the public and private health care sectors, to the extent permitted by law; and provides comments and advice at the request of OMB regarding specific Federal health information technology programs. ONC was established within the Office of the Secretary of HHS in 2004 by Executive Order 13335.

Patient Centered Medical Home (PCMH): Patient care is delivered by teams of primary care providers, including physicians, nurses and other ancillary providers.

Patient Portal: healthcare-related online applications that allow patients to interact and communicate with their healthcare providers.

Patient Health Record (PHR): systematic documentation of a patient's medical history and care organized by and for the patient.

Protected Health Information (PHI): any information relating to an individual's medical records, health plan beneficiary information, physical or mental health information, or provided health services or any information collected during health service.

Personally Identifying Information (PII): is information that can be used to uniquely identify, contact, or locate a single person or can be used with other sources to uniquely identify a single individual.

Primary Care Provider (PCP): a physician, such as a general practitioner or internist, chosen by an individual to serve as his or her health-care professional and capable of handling a variety of health-related problems, of keeping a medical history and medical records on the individual, and of referring the person to specialists as needed.

Record Locator Service (RLS): A Record Locator Service provides pointers to the location of patient information across an enterprise network. An RLS enables users to access and integrate healthcare data from distributed (non-centralized) sources.

Regional all-Payer Healthcare Information Council (RAPHIC): a federation of government, private, non-profit, and education organizations focused on improving the development and deployment of all payer claims databases that many states are undertaking. Convened by the NH Citizens Health Initiative and University of New Hampshire staff with the goal of engaging future users of the Maine and New Hampshire all payer healthcare claims databases in a discussion regarding multi-state collaboration. Soon after, other New England states joined the group. Currently, there is participation from nearly a dozen states.

Regional Extension Center (REC): as set out in the ARRA, Regional Extension Centers will be created by ONC to provide technical assistance and disseminate best practices and other information learned from the Health Information Technology Research Center to aid health care providers with the adoption of health information technology.

RxNorm: provides normalized names for clinical drugs and links its names to many of the drug vocabularies commonly used in pharmacy management and drug interaction software, including those of First Databank, Micromedex, MediSpan, Gold Standard Alchemy, and Multum. By providing links between these vocabularies, RxNorm can mediate messages between systems not using the same software and vocabulary.

Skilled Nursing Facility (SNF): an institution or part of an institution that meets criteria for accreditation established by the sections of the Social Security Act that determine the basis for Medicaid and Medicare reimbursement for skilled nursing care. Skilled nursing care includes rehabilitation and various medical and nursing procedures

Systematized Nomenclature of Medicine (SNOMED-CT): is a systematically organized computer process able collection of medical terminology covering most areas of clinical information such as diseases, findings, procedures, microorganisms, pharmaceuticals etc. It allows a consistent way to index,

store, retrieve, and aggregate clinical data across specialties and sites of care. It also helps organizing the content of medical records, reducing the variability in the way data is captured, encoded and used for clinical care of patients and research.

United States Department of Defense (DoD): is the U.S. federal department charged with coordinating and supervising all agencies and functions of the government relating directly to national security and the United States armed forces.

United States Department of Health and Human Services (HHS): is a Cabinet department of the United States government with the goal of protecting the health of all Americans and providing essential human services.

United States Department of Veterans Affairs (VA): is a government-run military veteran benefit system with Cabinet-level status. It is responsible for administering programs of veterans' benefits for veterans, their families, and survivors.

Visiting Nurses Association (VNA): The VNA is a nonprofit organization that delivers the highest quality home care, IV therapy, hospice, and community/public health services wherever clients call home.

Vermont Information Technology Leaders (VITL): Vermont Information Technology Leaders, Inc. is a 501(c)(3) non-profit public charity that was incorporated in Vermont on July 22, 2005. VITL operates the statewide health information exchange network for the state of Vermont.

Appendix C: Letter of Support from State Medicaid Director



Nicholas A. Toumpas
Commissioner

Kathleen A. Dunn
Director

STATE OF NEW HAMPSHIRE
DEPARTMENT OF HEALTH AND HUMAN SERVICES
OFFICE OF MEDICAID BUSINESS AND POLICY

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August 23, 2010

David Towne
State HIT Coordinator
Office of Health Information Technology
Department of Health and Human Services
129 Pleasant St
Concord, NH 03301

Dear Dave:

I am writing to express my support for Office of Health Information Technology's submission of its Strategic and Operational Plans for Exchange of Health Information in New Hampshire to the Office of the National Coordinator (ONC).

As the New Hampshire State Medicaid Director and a member of the New Hampshire Health Information Exchange Planning and Implementation (HEIPI) Project Steering Committee, I have had the opportunity to be fully involved with the development the State's health information exchange strategy. The plans being submitted to ONC for the HEIPI project represent the output of a fully collaborative effort with the Medicaid program's parallel Medicaid health information strategic planning process. The exchange capabilities that will be developed in New Hampshire will give providers the exchange capabilities they need to meet the meaningful use requirements of the electronic health record incentive program.

Sincerely,

A handwritten signature in cursive script that reads "Kathleen A. Dunn".

Kathleen A. Dunn, MPH
Medicaid Director

The Department of Health and Human Services' Mission is to join communities and families in providing opportunities for citizens to achieve health and independence.

Appendix D: Response to ONC Comments – Tracking Table

ONC Comment	Response
<p>Assessment of Hospital Readiness: The plan is dependent on the hospitals’ (as health information organizations that will connect to the statewide HIE) capability to meet the stage one meaningful use requirements (e.g. electronic lab results delivery, clinical summary document exchange). The plan indicates that the state will conduct an assessment of hospital needs after moving into the implementation phase. However, there is no discussion about how the state may assist hospitals in enabling necessary priority MU services, or ensuring that such functionality is enabled within hospital HIOs. Please describe how the state will assess hospital readiness in these areas and the strategies to ensure Stage 1 MU compliance within hospital HIOs.</p>	<p>-Paragraph added to SP-8.3 Architecture and Standards, Phase 1 architecture section. This new content explains how we will assess capabilities of HIE clusters and address capability gaps</p> <p>-New section added to OP-3.3 Architecture and Standards section entitled <i>Approach to HIE Cluster Readiness</i>. This section outlines the plan for assessing HIE clusters relative to stage 1 meaningful use criteria and HIO requirements, addressing capability gaps, and connecting HIE clusters to the statewide network.</p>
<p>Options for Unaffiliated Providers: The State Plan suggests that the HIE will offer unaffiliated providers an “on ramp” to the HIE. However, the Plan lacks specific operational detail on how this will be accomplished.</p>	<p>- New section added to OP-3.3 Architecture and Standards section entitled <i>Approach to Connecting Unaffiliated Providers</i>. This section outlines the process for identifying unaffiliated providers, assessing barriers to connecting these providers through existing or new HIE clusters, and facilitating connection of these providers.</p> <p>-New text added to OP-3.4 Services and Operations introduction and <i>Stewardship of Collaboration among New Hampshire’s HIE Stakeholders</i> sections</p>
<p>Governance Structure: The Plan does not fully discuss the risks associated with the process for establishing the governance structure. For instance, how will the state move forward in enabling their providers to meet the stage one meaningful use requirements if the legislature delays or denies proposals for the governance structure?</p>	<p>-Sub-section added to SP-8.1 Governance section titled <i>Contingency plan if General Court does not authorize “public instrumentality” organizational form</i>. This new sub-section details our intent to operate and govern the HIO within NH-DHHS in the event that the General Court does not authorize creation of a public instrumentality.</p> <p>-Paragraph added to SP-8.1 Governance section detailing the transition and timing for implementation of the contingency plan.</p>
<p>Strategies for Supporting Stage One Meaningful Use: The Plan does not describe specific or adequate strategies to fill the identified gaps in e-prescribing, receipt of structured lab results, and sharing of patient care summaries across unaffiliated providers.</p>	<p>-New text added to SP-8.4 Services and Operations, Phase 1 section. This new content makes explicit our phase 1 strategy for enabling exchange of structured lab results and patient care summaries, while clarifying our approach regarding e-prescribing.</p> <p>-New sections added to OP-3.4 Services and Operations section including <i>Stewardship of Collaboration among New Hampshire’s HIE Stakeholders</i> and <i>Statewide Network Services</i>. Both sections provide greater detail regarding our plan for identifying and addressing gaps in e-prescribing, receipt of structured lab results, and sharing of patient care summaries across unaffiliated providers.</p>
<p>-Standards: The plan indicates that the statewide HIE will be transmitting “closed envelopes of PHI</p>	<p>-New content added to SP-8.3 Architecture and Standards section, <i>phase 1 architecture</i> subsection. This</p>

<p>without having access to the records contained.” Please discuss how compliance with HHS-adopted interoperability standards, and data quality and integrity safeguards, may be or will be addressed and enforced on the statewide HIE under the proposed messaging architecture.</p> <p>-Standards: The “closed envelopes” and point-to-point exchange policy appears to require each pair of exchanging hospital HIE entities to work out individual interface specifications, on a pair-by-pair and protocol-by-protocol basis, propagating complexity, compared to a gateway architecture which hides and reduces complexity. Please address logistical concerns about the significant number of interfaces that must be developed and tested in the “closed envelope” environment.</p>	<p>content clarifies our approach to ensuring compliance with HHS-adopted interoperability standards.</p> <p>-New content added to OP-3.3 Architecture and Standards section <i>Approach to Standards and Support of Interoperability</i> subsection. This content details our current approaches to standards enforcement and our consensus based process to finalize our approach.</p>
<p>National Health Information Network: The plan narrative does not indicate how New Hampshire grantees or other state representatives may participate in the NHIN, other than “closely following the NHIN Direct.”. The plan suggests an intention to deploy a “NHIN gateway immediately in order to facilitate NHIN Direct transactions ... either through ... utilization of NHIN Connect, or in alignment with future NHIN solutions ...,” but this narrative is confusing with respect to the targeted purposes associated with NHIN Connect software and the NHIN Direct project, and further elaboration would be appreciated.</p>	<p>-All text regarding NHIN updated for clarity and accuracy including the following sections:</p> <ul style="list-style-type: none"> - SP-8.3 Architecture and Standards, subsection <i>Alignment with NHIN</i> - OP-3.3 Architecture and Standards, subsections: <i>Technical Approach 3. Implementation of National Standards</i>, and <i>Alignment with NHIN</i> -OP-3.4 Services and Operations, subsection <i>Use of NHIN Protocols/Standards and State Level Shared Services</i>