Development of State Level Health Information Exchange Initiatives

FINAL REPORT: Extension Tasks

Contract Number: HHSP23320064105EC
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Acknowledgments

Steering Committee

Chair
- Molly J. Coye, MD, MPH, Founder and CEO, Health Technology Center, San Francisco, CA

Committee Members

- Laura L. Adams, President and CEO, Rhode Island Quality Institute, Providence, RI
- Antoine Agassi, Director and Chair of the Tennessee eHealth Council, Nashville, TN
- Ray Campbell, Esq., MPA, CEO, Massachusetts Health Data Consortium, Waltham, MA
- Devore Culver, Executive Director, HealthInfoNet, Manchester, ME
- Lynn Dierker, RN, Director for Community Initiatives, Colorado Regional Health Information Organization, Denver, CO
- Lori Hack, MBA, Interim CEO, CalRHIO, San Francisco, CA
- W. Michael Heekin, Esq., Chair of the Florida Governor's Health Information Infrastructure Advisory Board, Atlanta, GA
- Marc Overhage, MD, PhD, FACP, FACMI, CEO, Indiana Health Information Exchange, Inc., Indianapolis, IN
- Jan Root, PhD, Assistant Executive Director, Utah Health Information Network, Murray, UT

Technical Advisors

- John Glaser, PhD, Vice President and Chief Information Officer, Partners HealthCare System, Inc.
- Stephen T. Parente, PhD, MPH, MS, Principal, HIS Network, LLC, and Assistant Professor, Department of Finance, Carlson School of Management, University of Minnesota
- Kala Ladenheim, Program Director, Forum for State Health Policy Leadership, National Conference of State Legislatures

Project Staff

Task 1
- Donald T. Mon, PhD - Principal Investigator, Vice President, Practice Leadership, AHIMA
- Harry Rhodes, MBA, RHIA, Director, Practice Leadership, AHIMA

Task 2
- Victoria M. Prescott, Esq. – Principal Investigator

Task 3
Avalere Health LLC:

- Gregory Fuller, Project Manager – Senior Associate
- Madeleine Konig, Senior Associate
- Sheera Rosenfeld, Director, Health Information Technology Practice
- Shannah Koss, Vice President

FORE Staff

- Linda L. Kloss, MA, RHIA, CEO, American Health Information Management Association (AHIMA), Chicago, IL
- Eileen M. Murray, MM, CFRE, CAE – Executive Director, Foundation of Research and Education, AHIMA, Chicago, IL

Office of the National Coordinator for Health Information Technology (ONC)

- Kelly Cronin, Director of the Office of Programs and Coordination
- Kathleen H. Fyffe, MHA, Project Officer

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Project Overview
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1 Project Scope and Genesis

This is the report of research performed under an extension to the contract from the Health and Human Services/Office of the National Coordinator (HHS/ONC) "Development of Consensus Best Practices for State-Level Regional Health Information Organizations." Three specific aspects of the operation of state-level Regional Health Information Organizations (RHIOs) were studied in this extension:

- **Explore the potential roles of and interactions between state-level RHIOs and federal activities for healthcare and information technology.**

- **Identify, examine, and analyze health information exchange (HIE) projects that have achieved financial sustainability.**

- **Explore the roles of public payers and their influence on state-level HIE activities**

Under the original contract, carried out between March and September 2006, a sample of state-level RHIOs was studied to determine successful governance, legal, financial, and operational characteristics and provide guidance for developing state-level HIE initiatives. A Steering Committee of state-level HIE leaders, with guidance from technical advisors and the National Conference of State Legislatures (NCSL) guided the study and shaped its key work product, the *State-Level Health Information Exchange Initiative Development Workbook,* now publicly available at www.staterhio.org.

In addition, a final report was issued with recommendations to advance state-level RHIOs. It addresses factors that both advance and impede the development of state-level RHIOs and calls for state, federal, and private sector action to strengthen the effect of state-level HIE activities. *The Final Report: Development of State-Level Health Information Exchange Initiatives* is also publicly available at www.staterhio.org. The three topics studied in this contract extension were recommended in the final report. Thus, this report is a continuation of the earlier research, drilling down in three areas that offer short-term insight policies and practices to advance and strengthen state-level HIE initiatives.

On September 12, 2006, the findings and recommendations of the original research were reported to the American Health Information Community (AHIC). During discussion, the role of HIEs in quality and transparency measurement and reporting was identified as another issue to be explored by the Steering Committee. Specifically, the Steering Committee was asked to offer recommendations regarding opportunities for coordination of HIE and quality reporting initiatives. These recommendations are also covered in this report as a fourth targeted study: *The Role of State-Level Health Information Exchange Initiatives in Quality Improvement and Reporting*.

2 Research Design and Organization of This Report

The four studies were conducted concurrently between September 15 and November 15, 2006, by four teams. The survey methods, findings, and recommendations are detailed in the project reports provided in the appendices.

The Project Steering Committee and investigators met October 23-24, 2006, to review the findings and draft recommendations for each study, including the roles of HIE organizations in quality improvement. Specific recommendations based on task research and analysis are presented in each of the task reports.   Readers are encouraged to consider the breadth of recommendations that are offered in the task reports, and in the final report of the original study.

TASK #1

**Relationship of
State-Level Health Information Exchange
to Federal and Other Major Health
Information Technologies Activities**

Table of Contents—Task #1

1 Overview of Task #1 Scope

1.1 How This Project Originated

A previous project funded by the Office of the National Coordinator for Health Information Technology (ONC), Health and Human Services (HHS), and American Health Information Management Association (AHIMA) and its Foundation of Research and Education (FORE) studied the successful governance, legal, financial, and operational practices of state-level health information exchange (HIE) initiatives. That initial project produced a final report, *Development of State-Level Health Information Exchange Initiatives*[1] and a workbook, *State-Level Health Information Exchange Initiative Development Workbook*.[2] The workbook provided guidance for developing state-level HIE initiatives. The final report contained a number of recommendations for further action or research needed to increase the likelihood of success for state-level HIE initiatives.

One of the recommendations was to study the interactions between state-level HIE initiatives and other health information technology (HIT) activities (e.g., those surrounding the electronic health record [EHR] and local Regional Health Information Organizations [RHIOs]) as well as the major federal HIT initiatives, including the Healthcare Information Technology Standards Panel (HITSP),[3] the Certification Commission for Healthcare Information Technology (CCHIT),[4] the Health Information Security and Privacy Collaborative (HISPC),[5] and the Nationwide Health Information Network (NHIN).[6]

The current project follows up on that recommendation. It is one of four recommendations stemming from the initial research funded for further study and is thus termed Task #1. (Note: The other three recommendations funded for further study revolve around state-level HIE financial sustainability, the role of Medicaid in state-level HIE activities, and quality reporting. Because Task #1 addresses barriers in coordinating HIT activities, many of the issues addressed here will touch on those other three tasks. When such issues arise, this report will focus on the aspects that affect the roles and interactions between state-level HIE and other HIT activities and refer the reader to those other task reports for more detail on the substantive issues.)

1.2 Task Description

The charge for Task 1 was to explore the potential roles of, and interactions between, state-level HIE initiatives and:

- Other HIT activities, including the major federal initiatives

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[1] AHIMA/FORE (September 1, 2006). Development of State -Level Health Information Exchange Initiatives. HHS Contract HHSP2332006410SEC.

[2] AHIMA/FORE (September 1, 2006). State-Level Health Information Exchange Initiative Development Workbook: A Guide to Key Issues, Options, and Strategies. Contract HHSP2332006410SEC.

[3] Healthcare Information Technology Standards Panel (HITSP). www.ansi.org/standards_activities/standards_boards_panels/hisb/hitsp.aspx?menuid=3.

[4] Certification Commission for Healthcare Information Technology (CCHIT). www.cchit.org.

[5] Health Information Technology Security and Privacy Collaboration (HISPC). www.rti.org/hispc.

[6] Nationwide Health Information Network (NHIN). www.hhs.gov/healthit/nhin.html.

- Other healthcare initiatives, not necessarily confined to HIT

1.3   Task Deliverables

- Recommendations for establishing formal communications among states and federal agencies, including a plan for informing state-level HIE entities of relevant federal initiatives

- Documentation of the barriers and concerns expressed by state-level HIE that HHS/ONC and other federal agencies can constructively address and alleviate

2 Methodology

2.1 Project Team

Principal Investigator. Donald T. Mon, PhD, vice president, Practice Leadership, AHIMA
Project Manager. Harry Rhodes, MBA, RHIA, director, Practice Leadership, AHIMA

2.2 Process

To accomplish the task, the project team:

- Reviewed existing materials generated from current federal initiatives—including the NHIN functional requirements, the HITSP use cases, and CCHIT certification criteria—and identified potential: (a) roles and interactions between state-level HIE initiatives and federal HIT activities, and (b) disconnects between them. These materials helped the project team identify the areas to probe during the interviews described below.

- Developed a set of basic interview questions designed to:
    - Identify state-level HIE barriers, concerns, and issues that should be addressed by HHS/ONC and other federal agencies.
    - Explore the potential roles and interactions and communications options between state-level HIE and federal HIT initiatives.

- Developed a representative list of individuals to interview. A maximum of 12 interviews were required under the contract.

- Interviewed the Project Steering Committee and individuals from the major federal HIT initiatives and other local RHIO projects.

- Reviewed and validated the findings and developed recommendations with the Project Steering Committee and technical advisors at a day and a half meeting held October 23-24, 2006. (See Appendix A.)

A total of 30 individuals were interviewed over 12 ninety-minute sessions. The following were interviewed:

- Members of the Project Steering Committee
- The four NHIN contractors and/or individuals from participating local RHIOs
- The CCHIT principal investigator, executive director, work group co-chairs, and staff
- The HITSP principal investigator and co-chairs of two technical committees
- Individuals from two state HISPC subcontractor organizations
- Individuals from other local RHIO projects

See Appendix B for the list of interviewees according to HIT initiative.

2.3 Interview Questions

Interviews with the identified subjects were conducted by phone. The project team began the interviews by asking the general questions attached in Table 1.


Table 1. Sample Interview Questions

1. What formal mechanisms of communication exist between state and federal activities? How can communication be improved?
2. What do you see as the roles of the state-level HIEs?
3. Do American Health Information Community (AHIC) use cases help align federal and state activities?
4. Standards and certification
   A. What standards should be developed, harmonized, or certified to support state-level HIEs and their interaction with other HIT initiatives?
   B. How does the timing of standards harmonization and certification compliance affect state-level HIE progress and interaction with other HIT initiatives?
   C. How does the existence of standards and certification help the state-level HIEs immediately and in the long term?
5. For specific examples of privacy, security, and confidentiality barriers
   A. Which ones affect state-level HIEs?
   B. Which ones can state-level HIEs affect?

These interview questions served as a guide, and specific areas were explored in varying degrees depending upon the interviewees' areas of expertise or concern.

The individuals interviewed represented the full range of federal, state-level HIE, and local- or regional-level HIE interaction (Figure 1). On one side, the state-level HIE needs to engage with the federal HIT contractors. On the other side, the state-level HIE must interact with local RHIOs.

Individuals from each of the federal HIT initiatives were interviewed, providing strong representation from that side of the spectrum. Among those individuals were participants from three RHIOs involved in NHIN contracts—the Santa Cruz RHIO, the North Carolina Healthcare Information and Communications Alliance, Inc. (NCHICA), and the Mendocino Health Record Exchange (Mendocino HRE). The Health Information Exchange of Montana (HIEM) and

**Figure 1.
Task 1 Studied Both Sides of State-Level HIE Interaction**

the Michiana Health Information Network (MHIN) represented the local RHIO perspective.
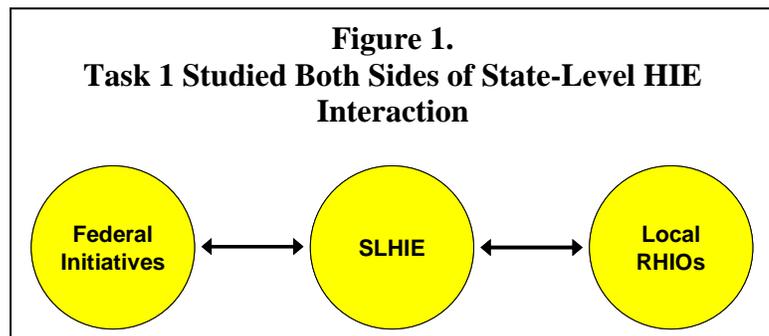
The Research Triangle Institute, contractor for the HISPC project, identified Minnesota and Oregon as two subcontracted states that could articulate well the security and privacy practices, laws, and
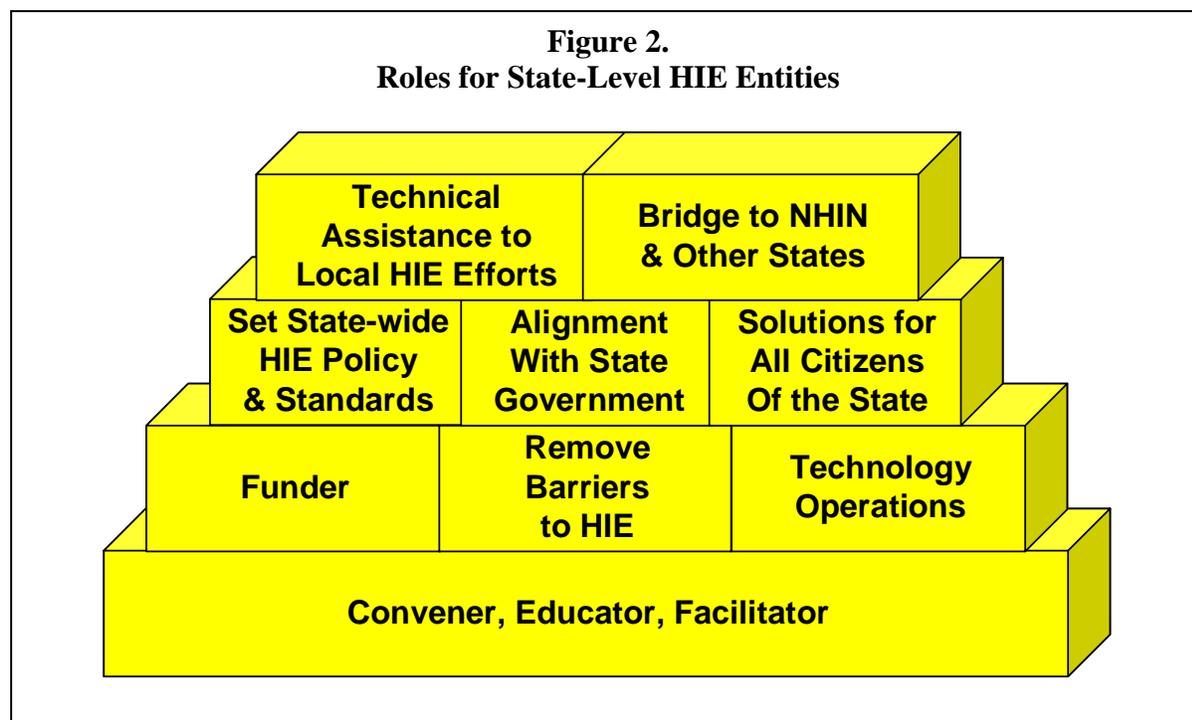
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regulations that could hinder HIE within their respective states and how that might affect the role of the state-level HIE.

3 Findings: Documenting Problems and Barriers

By themselves, the individual findings from the interviews are not groundbreaking. It is when the findings are combined with deeper analysis and the insights of those interviewed that the recommendations become bold. Interview findings are described below.

3.1   Validation of the Roles of the State-Level HIE

The initial project's final report[7] identified the various roles of the state-level HIE in detail and will not be repeated here. These roles are depicted at a high level in the categories shown in Figure 2. Because this study included a broader range of stakeholders than the initial report did, each of these roles were reviewed and discussed during the interviews.

Figure 2.
Roles for State-Level HIE Entities

Technical Assistance to Local HIE Efforts

Bridge to NHIN & Other States

Set State-wide HIE Policy & Standards

Alignment With State Government

Solutions for All Citizens Of the State

Funder

Remove Barriers to HIE

Technology Operations

Convener, Educator, Facilitator

By and large, the participants validated every described role of the state-level HIE. Some participants had slight concerns regarding a few of the roles, while voicing strong support for other roles. The salient findings are highlighted below:

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[7] AHIMA/FORE (September 1, 2006). Development of State -Level Health Information Exchange Initiatives. HHS Contract HHSP2332006410SEC.

- There was universal agreement that the state-level HIE plays a vital role as convener, educator, and facilitator. As shown in the recommendations later in this report, convening and educating will continue to be critical roles for state-level HIE when participating in federal initiatives in the immediate future.

- There was consensus that the state-level HIE could and should work with local RHIOs within the state to develop standard operational policies, business agreements, and the like. However, concerns were raised when "setting standards" was initially interpreted by some participants as technical or interoperability standards currently under the purview of standards development organizations (SDOs) or HITSP. These concerns diminished when the state-level HIE role was described as using existing standards, encouraging the rapid development and harmonization of standards from SDOs and HITSP, and facilitating the implementation of harmonized standards across the state as they are released. An important point arose from these discussions: there is a major disconnect between the standards being harmonized at the moment and those most urgently needed by state-level HIEs. Further action is required to increase the level of collaboration between standards harmonization and the state-level HIE business case.

- There was universal agreement that state government plays a significant role in HIE in setting policy, purchasing healthcare services, and monitoring public health and quality of care. There was strong consensus that state governments need to be much more involved in HIE initiatives than they are now, and they need to become involved immediately. State government involvement can greatly facilitate HIE and will be further discussed in the analysis and recommendations. See also Task #3's final report for more discussion on the role of state Medicaid agencies in state-level HIE initiatives.

- Participants generally agreed with the role state-level HIEs may play in providing HIE infrastructure and services (Technology Operations in Figure 2). Some of the more specific findings from this discussion are:

  - State-level HIE financial sustainability continues to be among the top concerns among the participants. It was pointed out that the services state-level HIE might like to offer first may not be those that are financially sustainable. Although this was also observed by the state-level HIEs themselves in the initial project's final report[8] and workbook[9], the important point to note is that other stakeholders have also expressed the same concerns, indicating that financial sustainability is everyone's top issue and should be among the first issues to be addressed. Moreover, there is a strong connection between financial sustainability and lack of alignment of both incentives and the sequence of industry actions in moving HIT forward.

  - There is strong agreement across all stakeholders that the NHIN will be composed of different HIE implementations at the state and local levels (see Figure 3) and that the NHIN can accommodate these variations only if the implementations are based on the same set of HIE standards. The message is that the notion of a single NHIN

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[8] AHIMA/FORE (September 1, 2006). Development of State -Level Health Information Exchange Initiatives. HHS Contract HHSP2332006410SEC.
[9] AHIMA/FORE (September 1, 2006). State-Level Health Information Exchange Initiative Development Workbook: A Guide to Key Issues, Options, and Strategies. Contract HHSP2332006410SEC.

infrastructure is not paramount and that more energy and resources should be committed for accelerating standards-based HIE development and deployment to support multiple levels of interoperability.

Figure 3.
Variations in State-Level HIE Technology Operations
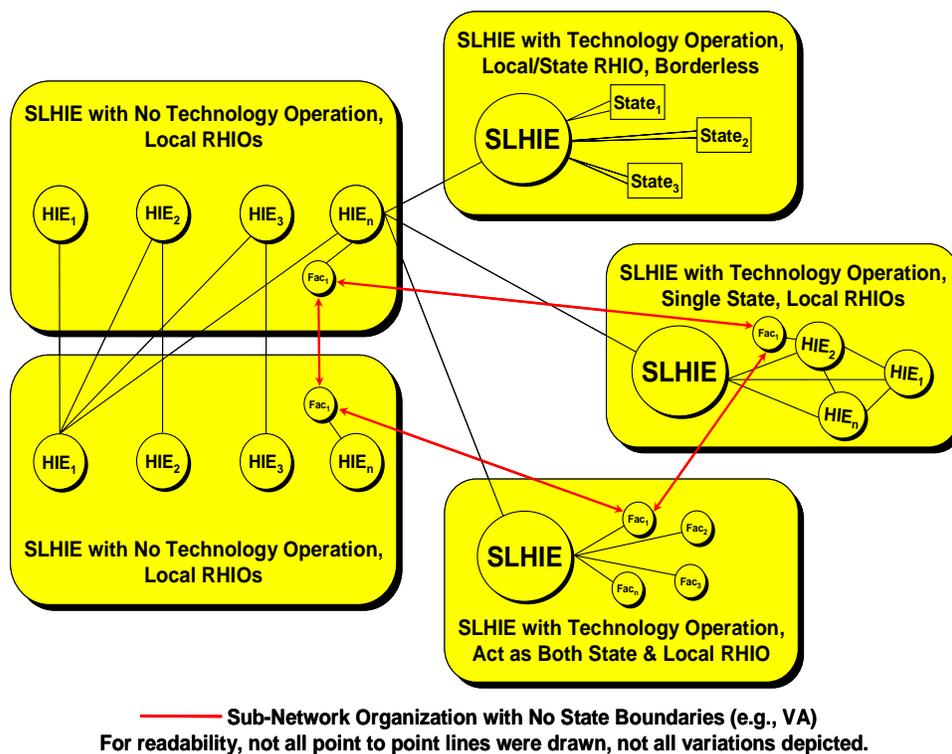
- There continues to be some disagreement about how thick or thin the NHIN should be. Part of the issue stems from the definitions of the words "thick" and "thin." However, the deeper issue is defining and testing the variations in network services between a thick and a thin architecture and how the current state-level HIE technology operations will coexist in the eventual NHIN. It is not desirable for state-level HIEs to replace existing technology and infrastructure to accommodate eventual nationwide standards.

- There was wide agreement that healthcare enterprises that crossed state boundaries (e.g., Veteran's Administration hospitals, proprietary health systems) could form their own RHIOs (the set of red arrows in Figure 3) and exchange health information internal to their enterprises within these, provided that such an arrangement is (as depicted in Figure 3) in addition to, rather than to the exclusion of, participation in the HIEs operating in the various local markets in which the healthcare enterprise resides. The need for HIE standards is underscored because enterprises participating in more than one RHIO will benefit from not having to work with different standards from one RHIO to another.

- The notion that a state-level HIE could provide services and technology operations to other states or regions bordering their state met no resistance. This finding supports the emerging concept of HIE service providers and supports the possibility that state-level HIEs can fill this connecting or coordinating role.

- Activities such as biosurveillance, public health reporting, population health status monitoring, and quality and performance measurement and reporting call for the aggregation of secondary data at the state level. At present, 38 states require healthcare entities to report or submit data for quality measurement or accountability purposes. A number of those interviewed saw potential for the state-level HIE as an ideal entity to aggregate the data on behalf of the state and disseminate it to the various public health, quality reporting, and other entities as appropriate. The need for coordination between HIE and quality and transparency initiatives is discussed more fully in the Task 4 report.

- The aggregation of secondary data also illustrated the difference between possible ideal roles for state-level HIE versus local RHIOs. Some participants advocated that, unless the state-level HIE operated as both a local RHIO and a state-level HIE, local RHIOs should handle HIE transactions and state-level HIEs should manage data aggregation for the state. However, it was emphasized that these decisions about roles and functions are a local matter and more than one model will be needed.

- Variations in business practices, as well as in security and privacy laws and regulations, reveal a potential role for state-level HIEs. Once iterative solutions are found through the current and post-HISPC process, state-level HIEs can then facilitate the actual implementation of HIE by developing model data-sharing agreements that can be used within the state. They may also be in the best position to negotiate data-sharing agreements with other state-level HIEs. Although there was some consensus around the feasibility of this role, the possible next step of actually playing a role in the physical sharing of the data across borders was considered much more difficult because of the challenges inherent in writing software logic that mirrors privacy and security laws. HIEs may also be in a position to advocate for changes to state law and regulation that impede or impair the efficiency of HIE.

3.2   HIT Projects Need Better Alignment and Coordination

All the participants acknowledged that there is more activity to advance HIT now than ever before in the industry. However, there was a universal feeling that the various HIT projects are still disconnected and need better alignment and coordination. Some examples that highlight these concerns are as follows.

- The use cases developed by the American Health Information Community (AHIC)[10] workgroups, although useful for the public good and important for advancing key areas of HIT, do not support the state-level HIE business cases and are therefore not a high priority for state-level HIEs. The emergency first response use case, for example, will certainly be needed to improve care during common emergency situations and natural disasters, but there is currently no business case to support implementation by state-level HIEs. The identification of use cases that create simultaneous value (i.e., both public good and a revenue stream for state-level HIEs) will accelerate their adoption.

- Currently, there is little sharing of lessons learned, products (e.g., business agreements, policies, service contracts), and services between the NHIN contractors and the state-level HIEs beyond those states directly involved in the NHIN contract projects.

- It is not clear whether the NHIN contractors will be funded for a second year, and, if so, what the next set of objectives will be. It is also unclear whether those objectives will leverage state-level HIE services and operations.

- There was major concern among the Steering Committee members that the State Alliance for e-Health project could disrupt the efforts of, and possibly drain resources away from, state-level HIEs. One of the primary concerns was duplication of efforts already under way between state-level HIEs and their state governments and the need to ensure that the State Alliance for e-Health project is fully informed of work in progress to avoid rehashing issues the state-level HIEs have already addressed. The Steering Committee applauded efforts to coordinate both their individual work and the work of this project with State Alliance for e-Health but strongly encouraged that the continued sharing of information be mandated by ONC to ensure coordination.

- It is unclear to participants whether the legislative branch is fully aware and supportive of the role of HIT in increasing patient safety and quality of care and if there is a congressional agenda to fund projects that will increase incentives for adopting HIT. This situation indicates that Congress may need further education of the issues surrounding HIT adoption.

- There is no central authority that: (1) is accountable for ensuring that HIT is directed toward transforming healthcare, or measuring progress against that goal; or (2) makes key HIT adoption-related decisions, such as resolving disputes among collaborating entities.

In summary, there is an understanding of how standards harmonization, certification compliance, security and privacy collaboration, and NHIN prototyping all relate strategically to the acceleration of HIT adoption. However, the disconnects among these tactical projects create the perception of multiple efforts directed at individual issues with no overarching strategic plan connecting them. It is unclear if funding and other resources are being allocated appropriately to ensure planned movement toward a common objective. There was also concern that current funding mechanisms

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[10] Office of the National Coordinator, American Health Information Community (AHIC). www.hhs.gov/healthit/ahic.html.

foster and encourage multiple start-up efforts but are not then sequenced to support next-stage growth and continued sustainability of projects.

3.3   Better Communication Needed

Better communication will obviously help achieve buy-in and move the HIT agenda forward. Examples of where communications can improve:

- The two-way communication paths between the various federal initiatives and the state-level HIEs are not clear. There are no current mechanisms for formalizing such communication. Specifying the communication paths and developing mechanisms for communication will increase collaboration among federal and state-level HIE projects.

- Given the proliferation of new HIT projects, and the confusion stemming from the problems and barriers documented in this report, it is easy to lose sight of how the current HIT activities map back to a guiding vision. The industry has seen various vision and milestone measurement documents, including the 2004 strategic framework[11] from ONC; the Secretary's 500 Day Plans; and, more recently, the guidance from AHIC. The participants would benefit from an update of the HIT vision that includes information on how current HIT projects map to, and are performing against, the current overall strategic objectives and which changes in the strategic vision may be indicated given two years of experience implementing the various HIT projects.

- The objectives of the NHIN contracts are not entirely clear. There is an understanding of the exploratory nature of these efforts, but less understood is how the NHIN projects and state-level HIE projects jointly study the issues. Disseminating more widely and more frequently the findings generated from the NHIN projects will help clarify and maintain the focus on the project's objectives.

4 Analysis and Recommendations

On the basis of the findings of this study, ONC and HHS should implement a series of strategic and tactical actions that:

- Refresh the HIT vision and reenergize the industry by creating clarity around the activities that will truly transform healthcare

- Clarify objectives, roles, and responsibilities among current HIT project activities

- Facilitate communication among the federal HIT project contractors and the state-level HIEs

- Align incentives and sequence funded HIT activities so that projects can build on each other

- Leverage the resources and knowledge of the state-level HIEs

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[11] Office of the National Coordinator for Health Information Technology (ONC). 2004. Framework for Strategic Action—The Decade of Health Information Technology: Delivering Consumer-centric and Information-rich Health Care. Washington, DC: Department of Health and Human Services. www.hhs.gov/healthit/strategicfrmwk.html.

- Communicate these actions clearly to the larger industry, as well as to those working on federal and state-level HIE initiatives

4.1 Transforming Healthcare: Refreshing the HIT Vision and Reenergizing the Industry

> **Recommendation #1**
> **Begin the transition to a public-private health information community successor to AHIC.**

Coordination of federal HIT and state-level HIE activities must be treated as both long-term and short-term issues. In the long term, coordination would be greatly aided by a transformational agenda, as well as a single authoritative body accountable for implementing the transformation.

Currently, AHIC is the entity responsible for providing "long-term governance for healthcare transformation." AHIC "is chartered for two years, with an option to renew for a duration of no more than five years…to be succeeded within five years by a private-sector health information community initiative."[12]

Although the initial directive was to follow AHIC with a private-sector health information community, it is recommended that a public-private collaborative succeed AHIC instead. Moreover, it is not too early to begin considering how the transition to a new public-private health information community will take place. Given that AHIC has begun its second chartered year, it may take a full year to work out the details of the new community, as well as the logistics of the transition. This timing may obviate the federal government's need to renew the current AHIC for an option year.

> **Recommendation #2**
> **The public-private health information community should develop a transformational agenda by the end of its first year of existence.**

The new public-private AHIC should be an organization composed of multiple stakeholders, with a commitment to quality, cost, and access improvement. It should be a learning community, using its authority and resources to educate providers, employers, and consumers; create innovative solutions; and disseminate information. Most importantly, it must be a body with sanctioned authority.

The new public-private AHIC should be the single body that:

- Is charged with developing and implementing a transformational agenda

- Has the sanctioned authority to set priorities and modify structures to support them

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[12] Office of the National Coordinator, American Health Information Community (AHIC). www.hhs.gov/healthit/ahic.html.

- Is advised by various sanctioned entities, including the federal contractors, the state-level HIEs, State Alliance for e-Health, SDOs, quality organizations representing the broad spectrum of care delivery, and consumers

- Is accountable for maintaining collaboration across the sanctioned entities

- Has the authority to resolve disputes among sanctioned entities

- Develops performance criteria to measure the progress of transformation through HIT

- Creates an inclusive process, encouraging engagement in the transformation by conducting open and transparent deliberations and consensus-driven processes

- Stays intact for three or four years, with staggered terms in office for its officials

- Has the necessary resources to carry out its activities

4.2 Align Incentives and Sequence of HIT Projects

> **Recommendation #3**
> **Select, develop, and fund demonstrations of use cases that align more clearly with state-level HIE or RHIO business cases.**

Although the transformational agenda is necessary for the long term, the disconnections among the various HIT projects need to be rectified now. The industry cannot wait until the transformational agenda is published two years from now. As outlined in the Findings (Section 3), the multiple barriers between the federal HIT and state-level HIE initiatives interact with each other causing a diffusion of focus and resources. The solution is to create a value proposition that advances the public good and aligns incentives for multiple stakeholders to contribute equitably to the building of HIE infrastructure or the delivery of state-level HIE services. In this manner, no one stakeholder bears the burden of funding state-level HIE infrastructure, but their collective contributions allow state-level HIEs to obtain a pool of funds to help build infrastructure or sustain services.

Although they are just one aspect in harmonizing project efforts, use cases are a concrete mechanism, one through which those involved in the various federal HIT and state-level HIE initiatives are well accustomed to creating and maintaining focus. Having use cases that promote integration will increase the level of coordination among initiatives.

> **Recommendation #4**
> **Select, develop, and fund demonstrations of new use cases that require the actual exchange of health information at the state level.**

The current set of AHIC use cases were initially selected because they offered great potential to effect short-term benefits for the consumer. Requiring actual exchange of health information at the

state level (e.g., between local RHIOs within the state or exchange of health information across state boundaries) as the next step of the use case compels HITSP to test its interoperability and CCHIT to certify both the EHR and the core network components. This requirement also compels state-level HIEs to be engaged in the development of certification criteria.

As mentioned in the Findings (Section 3), some use cases may not provide state-level HIEs with a viable business case. The intention of this recommendation is to engage state-level HIEs and other key stakeholders in identifying new use cases that will create value for the stakeholder and revenue streams for state-level HIEs. One stakeholder that should be engaged in this recommendation is state government. In the ensuing project, state government's needs (e.g., data aggregation for quality reporting, Medicaid reimbursement, public health, or population health monitoring) can be aligned with the state-level HIE business case. Educating the various state government agencies and offices will be a major effort required here. However, the state-level HIEs have a wealth of knowledge on the HIE issues plus existing work products to assist in the education process (e.g., policies, business agreements).

Recommendation #5
Align incentives and engage the state-level HIEs in the NHIN process.

Currently, the NHIN process and the state-level HIE initiative are two independent projects when, in fact, if incentives were aligned correctly, the state-level HIEs can serve as existing sites for testing and implementation sites for rollout. Engaging the state-level HIEs in the NHIN process may help contain project costs because some or most of the organizational and infrastructure start-up cost has already been incurred. The state-level HIEs can help build consensus and serve as a conduit to the local RHIOs for rolling out harmonized standards.

ONC and HHS should fund the NHIN projects for a second year, requiring that actual data exchange occur with at least one state-level HIE. The alignment of incentives and engagement in the NHIN process positions state-level HIEs to be NHIN service providers.

4.3   Communication

Recommendation #6
Implement a formal communication process between federal HIT projects and state-level HIE initiatives.

Better communication will obviously help increase awareness of what is happening in other projects that may affect state-level HIE projects and vice versa. Informal communication is not adequate to foster awareness and coordination. ONC and HHS should implement the following formal communication processes:

- Hold meetings with the state-level HIEs for ONC to discuss what it is planning and for the state-level HIEs to impart what they can do to support ONC activities. This can also serve as the mechanism by which ONC can communicate how current HIT activities map back to the strategic framework and overall HIT vision, gather information, and share eventual recommendations about updates to the vision on the basis of the experiences of the last two years.

- Require regular formal communication between stakeholders from the federal HIT projects and state-level HIE initiatives. These meetings should be used to discuss the priorities and business case options of the state-level HIEs and coordinate activities moving forward. The recommendation is that some of these meetings should be held regionally.

- Publish a monthly electronic newsletter highlighting the progress of the various HIT projects and how such progress has advanced the HIT vision.

- Host webinars when key information from other HIT projects should be imparted on a more timely ad hoc basis.

The above formal process can also be used to communicate project status to the larger industry, as well as to those working on federal and state-level HIE initiatives.

Appendix A—Agenda and Participants
at the State-Level HIE Project Steering Committee Meeting
to Review Initial Findings and Recommendations

Development of Consensus Best Practices for State-Level Regional HIEs HHS Contract Extension Steering Committee Attendees, October 23-24, 2006.

Entity	Person	Address
CalRHIO www.calrhio.org	Lori L. Hack, MBA Interim CEO	526 Second Street San Francisco, CA 94107
Colorado Health Information Exchange http://www.colorado healthinstitute.org/H ot_Issues/corhio.htm	Lynn Dierker, RN Director for Community Initiatives Colorado Health Institute	Colorado Health Institute 1576 Sherman St., Ste. 300 Denver, CO 80203
Florida Health Information Network http://www.fdhc.stat e.fl.us/dhit/index.sht ml	W. Michael Heekin, Esq. Chair of the Florida Governor's Health Information Infrastructure Advisory Council	930 Grey Field Place Atlanta, GA 30208
Indiana Health Information Exchange, Inc. www.ihie.org	Shaun Grannis, MD, MS Medical Informatics Researcher, Regenstrief Institute, Inc. and Assistant Professor of Family Medicine, Indiana University	351 West 10th Street Suite 252 Indianapolis, IN 46202
HealthInfoNet (formerly called Maine Health Information Network Technology) www.hinfonet.org	Devore S. Culver Executive Director HealthInfoNet	HealthInfoNet is housed in: Maine Health Information Center 16 Association Drive P. O. Box 360 Manchester Maine 04351-0360
MA-SHARE http://64.78.52.225/ ma-share/index.html	Ray Campbell, Esq., MPA, CEO Massachusetts Health Data Consortium	460 Totten Pond Road Waltham, MA 02451
Rhode Island Quality Institute www.riqi.org	Laura L. Adams Chief Executive Officer	One Union Station Providence, RI 02903
Tennessee	Antoine Agassi,	12th Floor Tennessee Tower

http://www.volunteer-ehealth.org/	Director & Chair of the State of Tennessee eHealth Council	312 Eight Avenue North Nashville, TN 37243
Utah Health Information Network www.uhin.com	Jan Root, PhD UHIN Assistant Executive Director	UHIN Washington Building, Suite 320, 151 East 5600 South Murray, Utah 84107
Principal Investigator	**Project Oversight of the Tasks I, II, III**	
Eileen Murray	Executive Director, FORE/AHIMA	AHIMA 233 N. Michigan Avenue, Suite 2150 Chicago, IL 60601-5800
Task 1	**Principal: Donald T Mon, PhD**	**Team Members: Harry Rhodes, Kala Ladenheim**
Donald T. Mon, PhD	Practice Leadership, AHIMA	AHIMA 233 N. Michigan Avenue, Suite 2150 Chicago, IL 60601-5800
Harry Rhodes	Technical Advisor/Privacy and Security, AHIMA	AHIMA 233 N. Michigan Avenue, Suite 2150 Chicago, IL 60601-5800
Kala Ladenheim	Program Director - Forum for State Health Policy Leadership National Council of State Legislatures	444 North Capitol Street, N.W., Suite 515 Washington, DC 20001
Task 2	**Principal: Viki Prescott**	**Team Members: Steve Parente**
Viki Prescott	Principal Investigator/Legal	452 Oakwood Drive Indianapolis, IN 46260
Stephen T. Parente	Technical Advisor/Financial Modeling	Stephen T. Parente, PhD Principal HSI Network LLC 2684 Lydiard Avenue Excelsior, MN 55331
John Glaser	Technical Advisor/Technology	Vice President and CIO Partners HealthCare 800 Boylston Street, Suite 1150 Boston, MA 02199
Task 3	**Principal: Gregory Fuller**	**Team Members: Madeleine Konig, Shannah Koss, and Sheera Rosenfeld**
Gregory Fuller, Project Manager,	Project Manager	Health Information Technology Practice Avalere Health LLC 1350 Connecticut Ave. NW Suite 900 Washington, DC 20036

Madeleine Konig	Task III Team Member	Health Information Technology Practice Avalere Health LLC 1350 Connecticut Ave. NW Suite 900 Washington, DC 20036
Shannah Koss	Task III Team Member	Health Information Technology Practice Avalere Health LLC 1350 Connecticut Ave. NW Suite 900 Washington, DC 20036
Sheera Rosenfeld	Task III Team Member	Health Information Technology Practice Avalere Health LLC 1350 Connecticut Ave. NW Suite 900 Washington, DC 20036
Kathleen Fyffe	Senior Advisor, Office of the National Coordinator	200 Independence Ave. SW HHH - 517D Washington, DC 20201
Kelly Cronin	Office of the National Coordinator, Director of Programs and Coordination	200 Independence Ave. SW HHH - 517D Washington, DC 20201
Linda Kloss	CEO, AHIMA	AHIMA 233 N. Michigan Avenue, Suite 2150 Chicago, IL 60601-5800
Carol Nielsen	Grants and Sponsored Programs	AHIMA 233 N. Michigan Avenue, Suite 2150 Chicago, IL 60601-5800

Appendix B—Individuals Interviewed

Name	Company	Initiative
Project Steering Committee		
Molly Coye, MD, MPH	CEO, Health Technology Center	Steering Committee Chair and Technical Advisor/Financial
Lori L. Hack, MBA	Interim CEO, CalRHIO	CalRHIO
Lynn Dierker, RN	Director for Community Initiatives Colorado Health Institute	Colorado Health Information Exchange
W. Michael Heekin, Esq.	Chair of the Florida Governor's Health Information Infrastructure Advisory Council	Florida Health Information Network
J. Marc Overhage, MD, PhD, FACP, FACMI	Director, Medical Informatics, Regenstrief Institute, Inc., and CEO, Indiana Health Information Exchange, Inc., and Associate Professor of Medicine, Indiana University School of Medicine	Indiana Health Information Exchange, Inc.
Devore S. Culver	Executive Director, HealthInfoNet	HealthInfoNet (formerly called Maine Health Information Network Technology)
Ray Campbell, Esq., MPA	CEO, Massachusetts Health Data Consortium	MA-SHARE
Laura L. Adams	Chief Executive Officer, Rhode Island Quality Institute	Rhode Island Quality Institute
Antoine Agassi	Director & Chair, State of Tennessee eHealth Council	State of Tennessee eHealth Council
Jan Root, PhD	Assistant Executive Director, UHIN	Utah Health Information Network
CCHIT		
Mark Leavitt, MD	Chairman, CCHIT	Chairman, CCHIT
Alisa Ray	Executive Director, CCHIT	Executive Director, CCHIT
David Tao, DSc	IT Architect, Siemens	Chair, Inpatient Interoperability Work Group, CCHIT
Barry Blumenfeld, MD, MS	Associate Director, Clinical Informatics Research and Development Partners Healthcare System	Chair, Ambulatory Interoperability Work Group, CCHIT

Sarah Corley, MD	Chief Medical Officer, NextGen Healthcare Systems	Chair, Ambulatory Functionality Work Group, CCHIT
Mark Del Beccaro, MD	Clinical Director, Information Services Associate Chief Emergency Division, Children's Hospital and Regional Medical Center	Chair, Inpatient Functionality Work Group, CCHIT
Cindy Spurr, RN, MBA	Corporate Director, Clinical Systems Management, Partners Healthcare System	Chair, Inpatient Functionality Work Group, CCHIT
HITSP		
John Halamka, MD, MS	CIO, Harvard Medical School CIO, Beth Israel Deaconess Medical Center Chairman, New England Health Electronic Data Interchange Network (NEHEN) CIO, Harvard Clinical Research Institute (HCRI) Associate Professor of Emergency Medicine at Harvard Medical School	Chair, HITSP
Floyd Eisenberg, MD, MPH	Managing Director, Clinical Informatics Secondary Data Use, Siemens Medical Solutions Health Services	Chair, HITSP Biosurveillance Technical Committee
Jamie Ferguson	Director, Health Information Technology Strategy and Policy, Kaiser Permanente	Chair, HITSP EHR Technical Committee
NHIN		
Greg Debor	Computer Sciences Corporation (CSC)	
Brian Kelly	Clinical Architect and Senior Executive, Accenture	
Greg Wenneson	PMP Director of IT/Project Manager, Alliance for Rural Community Health Ukiah, CA	
Richard S. Steen	IBM Global Business Services Healthcare-Strategy and Change New York, NY	
Ginny Wagner	Certified Executive Project Manager, IBM	
HISPC		
James Golden, MD	Project Director, Minnesota Privacy and Security Project	Project Director, Minnesota HISPC Subcontractor
Barbara Wills	Director, Center for Data Initiatives, Minnesota Department of Health	Minnesota HISPC Subcontractor

Jody Pettit, MD	Health Information Technology Coordinator, Office of Oregon Health Policy and Research	Project Director, Oregon HISPC Subcontractor
Local HIE, State-Level HIE Not Included in the Contract		
Robert Keet, MD	President, Western Medical Associates Clinical SME, Northrop Grumman	President, Santa Cruz, CA RHIO
Holt Anderson	Executive Director, North Carolina Healthcare Information	Executive Director, North Carolina Healthcare Information and Communications Alliance (NCHICA)
Alan Snell, MD, MM	Chief Medical Information Officer, Saint Joseph Regional Medical Center	President, MHIN Board
Candy Deruchai	Director, Kallispell Regional Medical Center	Health Information Exchange of Montana
Robert Olsen	Vice President, Montana Hospital Association	Health Information Exchange of Montana
Jeanie Gentry	Vice President, Allied Health, St. John Lutheran Hospital	Health Information Exchange of Montana
Alan Snell, MD, MM	Chief Medical Information Officer, Saint Joseph Regional Medical Center President, Michiana Health Information Network (MHIN) Board	Michiana Health Information Network (MHIN)

TASK #2

Report and Recommendations on Health Information Exchange Services That Are Financially Sustainable

Table of Contents—Task #2

1   Overview of Task #2 Scope

Task*:   Identify, examine, and analyze health information exchange (HIE) services that have achieved financial sustainability.*

Deliverables:
1.   Describe the parameters of financial sustainability in a way that serves as a guide to examining successful services and will also be a valuable definition for use by developing state-level HIE initiatives.
2.   Identify and describe HIE services that meet the parameters of financial sustainability. The Office of the National Coordinator for Health Information Technology (ONC) expects that this will involve no more than six entities and as many as 10 specific revenue-generating HIE services. Study these HIE services and describe their characteristics and reasons for their success.
3.   Provide recommendations on the listing of services, whether to pursue or defer, and other comments that may be useful to state-level or regional HIE initiatives.

2   Parameters for Defining Financially Sustainable HIE Services for Task #2 Purposes

2.1   HIE—In General

HIE can be viewed as an umbrella term for several different types of specific exchanges of clinical data:

- <u>Patient summary</u>—the ability to retrieve a comprehensive set of clinical data from regional providers (and payers) for a specific patient. For example, this retrieval might involve a request by a physician to pull data for a patient who was just admitted to the emergency room. The information included in the resulting patient summary would depend on the type of data available. For example, it could be simply a medication history for the patient, or it could be a more comprehensive set of data, including laboratory results, transcribed notes, radiology images, and EKG results.
- <u>Clinical messaging</u>—the delivery of clinical results (e.g., discharge summaries, laboratory test results, consult notes) from the organization that generates the data (e.g., laboratory, radiology center) on a push basis to a targeted set of recipients (e.g., the referring physician).
- <u>ePrescribing</u>—involving the movement of prescription-related transactions among providers, pharmacy benefit managers (PBMs), and pharmacies.
- <u>Quality measurement</u>—clinical data can be aggregated and used for reporting on the achievement of quality measures and for decision support (e.g., reminders) to improve clinical care.

- <u>Biosurveillance or syndromic surveillance</u>—involving monitoring of clinical data (e.g., emergency department chief complaint, positive lab results) for disease outbreak or bioterrorism event.
- <u>Chronic disease management or other population-based services</u>—clinical data can be used to aid in the management of chronic or other diseases that impact populations.

In addition, the exchange of administrative data (data used for processing payment for healthcare services) can also be included under the broader HIE umbrella. These exchanges have certainly proven to be viable business models that HIE initiatives can learn from and that may serve as core, sustainable activities to support the infrastructure on which one could build other services more directly related to the improvement of clinical care.

To determine which services would be potential candidates for inclusion in Task #2, parameters for defining the scope were necessary. The project team developed the following set of parameters:

2.2 Defining an HIE Service

First, there is no generally accepted, clear definition of an HIE service. For the purposes of Task #2 and the general relevance to achieving the vision set out in the *State-Level Health Information Exchange Initiative Development Workbook,* the following parameters were applied:
- Task #2 scope is not limited to state-level HIE services.
- "Service" does not mean the entire HIE organization but rather a specific service.
- The service must exchange health information among multiple parties or stakeholders. A service with only two parties sharing data would not be considered for inclusion.
- A project merely to implement or increase adoption of electronic health records (EHRs) in physician offices would not be considered an HIE service for Task #2.
- A project merely to implement or increase adoption of telemedicine would not be considered an HIE service for Task #2.
- A service to share clinical data, administrative data, or both could be considered an HIE service for Task #2.

2.3 Defining "Financial Sustainability"

Second, as used herein, "financial sustainability" is defined as having sufficient revenue for ongoing operations of the particular service (as opposed to an entire organization). The sustainability assessment did not include the need to recover initial start-up costs because relevant information on initial start-up costs was scarce during the interviews for a number of reasons. For example:
- Part of the infrastructure needed was preexisting.
- Parts of the infrastructure have multiple other uses, and start-up costs cannot be allocated to this one service.
- Many start-up costs were funded through grants from local philanthropic, state, or federal monies.
- Start-up costs slowly accrued over time and were not tracked or allocated to this service.
- Start-up costs were incurred some time ago, and accurate information is not available.
- Start-up costs were incurred some time ago, and the costs today would not be the same because of newer technologies currently available.

Note that, due to the nascence of the HIE industry, some of the services identified and described in this report may have short track records or no track record but enough evidence and financial commitment to argue for financial sustainability. The goal was to include as many different types of HIE services as possible that are financially sustainable or show strong promise and corresponding financial commitments from participants.

3 Findings

The appendices describe the team, list the projects studied, and summarize the findings of the information gathered from the companies interviewed in this Task #2. Specifically, Appendix A lists the project team who worked on Task #2. Appendix B provides a listing of the companies interviewed. Appendix C summarizes the revenue and operations model for the different HIE services studied (to the extent available).

4 Analysis and Recommendations

This section discusses some of the advantages of specific HIE services and which market conditions would be most favorable. Then, some overall observations regarding sustainable HIE services are made, followed by recommendations on implementation of specific HIE services. Finally, a few suggestions are made as to how a state-level HIE initiative could support and encourage the development and implementation of sustainable HIE services.

4.1 Analysis of Specific HIE Services

Several different types of services could be included under the HIE umbrella. The following discusses some of the advantages of each HIE service, as well as offering a summary of which local market characteristics would be conducive to or prohibitive of the successful launching of the specific HIE services.

4.1.1 Clinical Messaging

Brief Description: "Clinical Messaging" is an HIE service that delivers electronic clinical results (such as laboratory test results, radiology reports, or transcribed reports) from the source system (e.g., laboratory, radiology center) to the intended recipients (e.g., ordering physician, primary care physician).

Common Advantages to This HIE Service:
- Physicians like having to go to only one location to retrieve clinical messages from multiple sources (reduces staff time). Plus, if the physician did not receive electronic results before, there is the obvious advantage of having it electronically, rather than receiving and sorting through faxes or having to open mail.
- Physicians generally receive the results faster if they were receiving them via fax or mail before.
- Hospitals like the reduced cost of not having to maintain their own department to deliver clinical results.

- This system eliminates the need to manage and store paper results for the physician and for the hospital.
- No master patient index is required to implement clinical messaging; only the physician list must be maintained.
- This system could serve as a platform to enable the push of urgent information to physicians (e.g., public health alerts).

4.1.2 Sharing Clinical Data on a Patient at Time and Point of Care

Brief Description: "Sharing Clinical Data on a Patient at Time and Point of Care" is an HIE service that gathers and provides electronic clinical information (e.g., patient's medical history to the extent available) from multiple sources about a particular patient when the patient presents for care.

Common Advantages to This HIE Service:
- Having the patient data available at the time of care is of tremendous benefit for treating the patient and enhancing the probability of positive outcomes. Ensuring that everyone has a common understanding of the value of HIE to patient care is essential.
- Facilitates more effective management of chronic illnesses.
- Improves patient safety by helping avoid errors.
- Helps reduce duplication of diagnostic tests.
- Improves the continuity of care among multiple physicians treating the patient.
- The ability to aggregate, standardize and analyze clinical data can also benefit public health, scientific researchers, and public policy development.
- The addition of clinical decision support and reminders functionality can further aid providers.
- Of critical importance for national emergencies.

4.1.3 Medication History

Brief Description: "Medication History" is an HIE service that electronically shares a patient's medication history obtained from multiple sources (e.g., PBMs) with the clinician or institution treating the patient. Often, this information is useful to hospitals to aid in their medication reconciliation process (required under hospital accreditation under JCAHO[1]).

Common Advantages to This HIE Service:
- The value to clinicians and hospital pharmacists or others involved in the medication reconciliation process of having the patient's medication history available at the time of treatment is of high importance because:
  - o Patients frequently do not know what medications they are using;
  - o Other medications could indicate other illnesses that the patient is being treated for, which could affect the immediate treatment regimen; and
  - o Interactions with other drugs and adverse drug events could be avoided.

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[1] www.jointcommission.org.

- Some sources of medication history have been pooled (e.g., RxHub) and thus require only one interface to such source. The number of interfaces necessary to set up and maintain a medication history service with enough data to be meaningful[2] may not be high; however, certification of the software may be necessary.
- Of critical importance for national emergencies.

4.1.4 ePrescribing

Brief Description: "ePrescribing" is an HIE service that automates the process for clinicians to prescribe medications for patients by electronically delivering the prescription information to the retail pharmacy or mail-order service.

Note that medication history could be delivered through an ePrescribing application to the physician placing the order; however, for discussion purposes, medication history as an HIE service was addressed previously in section 4.1.3.

Common Advantages to This HIE Service:
- Physician practices save staff time of having to answer calls from pharmacies to clarify orders and to approve refills; however, work-flow issues must be addressed early to ensure adoption. Can be a valuable benefit to a medical provider previously unfamiliar with HIE services.
- Orders are more accurate, which is expected to reduce the need to resubmit prescription requests that did not comply with the formulary and to reduce possible prescription errors and adverse drug events.
- Formulary information available to clinicians at time of prescribing would benefit patients, PBMs, and payers by selecting drugs on formulary thus reducing the patient's out-of-pocket costs.
- Pharmacies benefit by reducing the need for faxing.
- Medication management is improved.
- Once the ePrescribing software is certified with the various data providers and delivery network, there would be a higher barrier to entry for others seeking to provide a similar service.

4.1.5 Quality Metrics

Brief Description: "Quality Metrics" is an HIE service that shares healthcare information among multiple data sources for the purpose of quality measurement that can support provider quality initiatives and also serve as a basis for determining incentives (e.g., pay-for-performance or pay-for-quality) to providers from payers.[3]

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[2] No medication history service would purport to provide a complete medication history on the patient because of the number of different sources and limited availability for that data. There are also over-the-counter (OTC) drugs that are not tracked or available, so the physician must still speak with the patient and use clinical judgment when making treatment decisions. It may be advisable to include disclaimers in this regard.

[3] Note that a quality metrics project does not imply that the results of the measurement will automatically be disclosed to the public. Which results are disclosed and who they are disclosed to would be the decision of those involved and

Common Advantages to This HIE Service:

- Payers expect improved quality and anticipate efficiency improvements from high-quality care. By providing a consistent program across payers, they hope to have more influence helping physicians improve the quality of care they provide.
- Providers benefit by having a consistent set of quality measures along with information and incentives that help them and that they can work toward improving.
- If the quality of care is increased, patients will have better outcomes, including fewer exacerbations and/or need for acute care.

Note: This discussion relates to the use of clinical data combined with claims data for quality reporting. Several initiatives are under way in which payer claims data alone are being combined and aggregated by a third party to use as a basis for payment incentives to providers for performance. Task #2 did not pursue data regarding those initiatives, because many are still in their infancy and limited information is available.

4.1.6 Administrative Data Sharing

Brief Description: "Administrative Data Sharing" is an HIE service that shares electronic administrative information related to the payment of a claim for healthcare services (e.g., claims data, eligibility) among multiple parties.

Common Advantages to This HIE Service:

- Reduce the number of days required to pay a claim.
- Payers and providers alike reduce staff time spent inquiring and answering claim status requests.
- Fewer proprietary interfaces to support.
- Increased clean claims, requiring less processing.
- Reduction in write-offs by providers because of eligibility and exceeding the file limit.
- If most payers are local, there will be more of an affect on the participants. If national payers dominate the market, the project may not get the attention of enough key participants to be viable.
- Having the administrative claims data available (e.g., in a data repository) and the content standardized and structured to enable querying for specific events (e.g., quality metrics) could provide an opportunity to link clinical and administrative data for quality-oriented efforts. Neither of the two administrative data-sharing services studied store the claims data centrally, but rather they act as a conduit for delivery.

4.1.7 Credentialing

Brief Description: "Credentialing" is an HIE service that centralizes and shares the information necessary for clinicians to become credentialed at healthcare institutions and/or with payers.

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must comply with applicable law. In the instance of Regenstrief/IHIE example, the results are not made available to the public, and the payers and providers must come to mutual agreement on the report formats and type of content, what is measured, and who will be provided which reports.

Common Advantages to This HIE Service:
- Clinicians benefit from not spending as much time completing the credentialing process at multiple institutions.
- Institutions save time by not having to ask for missing information.
- If there is a lack of collaborative spirit in the region, a straightforward service like this with clear potential return on investment (and no real competitive advantage in the data being exchanged) may be a good way to foster initial collaboration.
- If there are no standards in the community, this service will be valuable. However, some states have adopted laws establishing standards for credentialing, so the benefits of a credentialing service may not be as significant in those states.
- Could use this project to maintain a master physician list, which could benefit other services, such as clinical messaging.

4.2   Common Enablers

There are several sustainability enablers and conditions that were found to enhance the likelihood of project success and were common to many of the HIE services studied:

Planning
- Proper planning and understanding of the complexity of the service are essential to success because organizations often underestimate the size and scope of the project. For each of these services, there can be very significant (and poorly understood) challenges, some of which are mentioned in this report. Failure to estimate the magnitude of these challenges appropriately can lead to cost overruns and delay participant willingness to provide operating revenues. The sustainability of the service can evaporate.
- A clear understanding of the business case for each participant involved in an HIE service is critical. Tailoring the specifics of the service to address valid concerns of the participants is helpful, as long as one is careful to avoid too much customization, which can affect the costs involved in maintaining the service and the ability to expand to include other participants.
- It is also important to understand the affect on the business models of other entities in the community. The old adage "one man's loss is another man's gain" holds true for HIE services as well. The HIE service may be viewed as a disruptive technology to other vendors or other stakeholders who have an interest in keeping things status quo.
- Although there is no standard financial sustainability template that is either part of professional training or used by experts and designers building HIE services, clear financial commitments early on from participants expected to pay for the service and solid commitments from data sources to provide the needed data are vital to increasing the project's chances of success in this uncharted territory.

Participation
- A critical mass of participants is necessary. Failure to address this challenge adequately can lead to services that never deliver enough value to justify participant funding. It may be feasible to start with one participant, if large enough; however, expansion to include

multiple participants will reduce the reliance on any one source of revenue and will enhance the likelihood of sustainability over time.

- A history of collaboration among participants is beneficial (e.g., one community's hospitals came together to create a common Web portal, another formed a shared critical air ambulance service, and another collaborated on a research project). Thus, if there is no prior collaboration, it might be good to start with a small project that is less invasive to get the partnering off the ground.
- Strong leadership from the provider community was common for projects involving clinical data. Clinician adoption is key for most HIE services.
- The participants' willingness to make work-flow changes will depend on their perceived value of the service and incentives to adopt the service.
- Early-stage participants who commit to the HIE must perceive a clear return on investment (not necessarily just monetary) from taking a "first cooperative mover" position. Be careful not to set a precedent that cannot be maintained in the long run.

Operations

- A critical mass of data is necessary to make the service valuable to participants. The number of interfaces necessary to be able to assemble enough data to be useful could be high, so the costs to implement would correspondingly be higher.
- The participants' IT staff may have other priorities. Commitment at the highest levels of an organization will help ensure that priorities are set at the lower levels to make the HIE service happen.
- If consensus on standards is required, it is never easy, and adequate time should be allowed.
- Increasing broadband access in rural areas can facilitate the participation by rural physician offices.

Market and Financial Conditions

- Self-interest of a critical mass of key participants must be aligned to enable HIE sustainable cooperation. The participants have to agree not to compete on the subject of the particular HIE service. The concepts of shared services and economies of scale can be emphasized.
- The price to participants must be in line with the perceived value of the service. In addition, the benefit of the HIE entity providing the service must be considered versus a commercial entity or other competitor doing it. Accordingly, the competition landscape should be carefully monitored.
- A market that is sufficiently but not overly fragmented. If there is little fragmentation, a dominant organization may attempt to provide its own proprietary exchange. Too much fragmentation can make the task of collaboration much more difficult and the challenge of attaining a critical mass of data much more expensive and time-consuming.
- The absence of any one dominant participant attempting to grab market share aggressively from the others or attempting to attain a material competitive advantage over others also favors collaboration on HIE projects.
- Payer reimbursement incentives for any of these HIE projects would also help spur participation.

4.3 Recommended Approach Overall

4.3.1 Overall Observations

For the past two years, the industry has focused on HIE architecture, data standards, and privacy models. The importance of the financial sustainability of these undertakings has only recently been elevated in priority. In general, the HIE service should work to reduce the rate of growth of health care costs. Any project that increases the cost of health care is not likely to succeed.

Although there are few sustainable exchanges, the main point is that there *are* some sustainable HIE services. Technology alone is not a panacea, but rather a thoughtful plan for gaining acceptance of the HIE service by a critical mass is needed to enable financial sustainability. The market factors that enable an exchange to be successful and the challenges that confront efforts to become sustainable are not well understood. A solid grasp of the market factors influencing the HIE service and a constant monitoring of the competitive landscape are essential to success. More enablers and/or more barriers may surface at any time, and the ability to react and adjust the HIE service's business model may be necessary to sustain success. The conclusions drawn in the previous section provide some insight into these factors and challenges, but more extensive and in-depth research and experience will be needed.

There is no single approach to achieving sustainability. The projects examined were diverse in scope, activity, and technology. There can be multiple options for any one service type. In addition, there may be other services not yet identified that would be successful and would move the organization closer to achieving the HIE vision. Further innovation in this nascent field is expected.

To date, local community HIE initiatives appear to be more successful than state-level HIE initiatives. This may be due to the fact that the development of state-level initiatives has been more recent, and many are still in the formation stage. However, it may also be due to the fact that it is inherently more difficult and time-consuming to engage and gain consensus from a broader array of stakeholders in order to launch a state-level project or service.

4.3.2 Recommendations on Specific HIE Services

The following recommendations relate to *specific* HIE services. Recommendations regarding the revenue model to support an entire organization, or a state-level HIE initiative that may offer other services, are not addressed in Task #2. As a general principle, an HIE initiative should leverage any infrastructure built and any clinical data collected for developing additional services. It may take a menu of revenue-generating services offered by an HIE initiative to become truly financially sustainable and to support the costs of the infrastructure necessary over time.[4] Other secondary uses of the data that may not generate revenue but would have other benefits for the community could

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[4] Note that there may be a larger value proposition, separate and apart from revenue generation, that may influence the desirability of pursuing a particular HIE project. Those considerations are outside the scope of Task #2. Some of those issues were more thoroughly addressed in the *State-Level Health Information Exchange Initiative Development Workbook*.

also be explored (e.g., public health, research). The key is not simply to build another "silo" of data but rather to leverage the reuse of the data for purposes that are acceptable to the community. Local circumstances and market conditions will dictate where the HIE initiative should focus its initial efforts. The recommendations that follow are a generalization, and a particular state or region may be more favorable than another for the particular HIE service. In addition, particular laws or regulations may affect the viability of the planned service, which must be carefully reviewed and understood.

4.3.2.1 Recommended Initial Services

On the basis of the information collected, clinical messaging is a good starting project. There is a fairly easy-to-understand return on investment. Clinical messaging would establish the connections needed between the clinical data providers (e.g., hospitals, reference laboratories) and the physician offices. Also, it is not necessary to create a master patient index for patient matching to do clinical messaging (simply knowing the physician is the key). Another major advantage is the clinical relevance of laboratory results, and other data typically included in a clinical messaging service, to the treatment of the patient.

Medication history could also be a good first project. As mentioned earlier, a medication history function may be included in an ePrescribing service, but it can also stand on its own. Hospitals may be willing to pay for medication history by itself because it would be valuable to reduce time spent in the medication reconciliation process required by JCAHO. Others may be willing to pay for this service, but no current examples were found.

4.3.2.2 Recommended Secondary Services

ePrescribing usually will provide eligibility and formulary information, which could help reduce drug costs and increase efficiencies. ePrescribing would also provide other benefits, such as the reduction in administrative expense related to prescription legibility and processing of refills. In addition, ePrescribing has a positive effect on more stakeholders than does medication history alone (e.g., pharmacies, physicians, PBMs, health plans, employers, and patients). However, ePrescribing is more difficult to implement than medication history in a number of ways. First, the software application that the physician would use must be well adopted, that is, used by a critical mass of physicians to make the investment in ePrescribing feasible. Issues involved in incorporating the ePrescribing process into the physician's workflow are not insignificant. Second, the software to interface with the ePrescribing delivery network typically must be certified. The certification process takes time and resources, which must be factored into the business plan if the HIE initiative chooses software that has not already been certified. Third, data format and vocabulary issues must be mapped and addressed, many on an ongoing basis. Fourth, it is important to ensure a critical mass of pharmacies and PBMs are covered to warrant adoption. Momentum seems to be building in the public payer community in support of ePrescribing initiatives, which may warrant embarking on evaluating the feasibility of an ePrescribing service for a particular community or state.

Sharing the full clinical patient summary is a large project to tackle that would require more investment and time to implement. It would also require the creation of a master patient index or some way of matching patients to be able to retrieve the correct data on the patient. Such an HIE

service is highly valuable for treating patients and should ultimately be pursued but perhaps might not be a good choice for a first project. Also, the financial sustainability model is not clearly understood or developed. It is difficult to project the value of this type of exchange across providers, payers, and patients. Hence, there will be hesitancy to invest given the intangible nature of the value and the difficulty of determining who receives the value. A subscription model could be explored and may be feasible, but such a model has not yet been developed.

A quality measurement and/or reporting service is not really feasible until a significant base of clinical data is accumulated to make the quality measurements meaningful. Although such a project would be very relevant to improving clinical care, it would not be a good candidate as a first project. It also would take much more time to implement, because there would need to be consensus on what quality metrics to collect, how to analyze them, and who would have access to the results.

Note on secondary uses: The primary use of clinical data exchange is for improving the treatment of the patient. However, once there is enough of a base of data, a number of different secondary uses of the data could become attractive and would generate interest from the research community, public health, and the pharmaceutical industry, among others. Care should be taken when exploring these secondary uses of data so as not to jeopardize the chance of receiving and utilizing the data for its primary use. In some communities, the issue of secondary uses may be viewed as controversial, and if it comes up too soon in such a community's process, it could result in conflict and loss of momentum, not to mention shaking fragile bonds of trust before anything has gotten off the ground. It is advisable to focus on where stakeholders can agree and to start small to foster trust between the participants. It is too early to assess the potential of these secondary use areas for spawning HIE services that are financially sustainable. As the HIE initiatives grow and mature, there will be more knowledge and experience to gain and share.

4.3.2.3 Services with Limited Applicability

Administrative data exchange would not be a good place to start today because most of the major investments have already been made in response to the passage of HIPAA. Thus, there may be little opportunity to enter this field now. Furthermore, administrative data exchange, although providing administrative benefits and cost reduction, does not move the HIE initiative closer to achieving the vision of providing appropriate access to patient medical history at the point of care. However, if strong market conditions favor an administrative data exchange, it might be useful in establishing the infrastructure on which other services more relevant to clinical care could be built. Another weakness of administrative data exchange may be that national insurers or their agents may build their own systems to use as a utility function. The rationale for such activities is that large ERISA[5]- exempt employers often view health benefits for a national or multistate region.

A credentialing service may be feasible in a given region, but it will likely not help create the broader infrastructure necessary to enable other HIE services. However, it could serve as a starting point for a master physician list that would be useful for clinical messaging or other HIE service for which matching the physician is important. In addition, it could encourage collaboration among stakeholders as they strive to develop a standard. However, similar to administrative data exchange,

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[5] Employee Retirement Income Security Act of 1974.

credentialing as a service may not move the HIE initiative toward improving patient treatment. Furthermore, credentialing is a service that may be provided by other national payers or their agents. Already, many make such services available. There also may be an issue regarding re-creating efforts currently under way by the Council for Affordable Quality Healthcare (CAQH).[6]

4.4   Recommendations for State-Level HIE Initiatives in General

As discussed in the *State-Level Health Information Exchange Initiative Development Workbook,* the state-level HIE initiative could opt to play a number of different roles. If it chooses not to pursue the HIE services described in this report, there are still activities a state-level HIE initiative and/or a state government can do to have a major effect or influence on HIE in the state and to encourage some of the HIE services described in this report. Here are some examples:

- Promote and nurture collaboration among stakeholders.
- Broadly communicate to stakeholders the value of reducing variation and duplication in the creation of new databases and services across the state. At a minimum, the state-level HIE initiative should stay alert to any plans in the state to create data services that it could feasibly provide and at least have a conversation with those involved about the value of avoiding duplication. It will not always be possible to integrate, but at least an attempt will be made to do so where it makes sense.
- Remove or modify laws that are barriers to the particular HIE service (e.g., a West Virginia state law makes "fully automated" electronic prescriptions illegal[7]).
- Enact laws that encourage HIE or the use of HIT (e.g., a law that limits the ability of a physician to issue handwritten prescriptions).
- Leverage the state's executive office as a vocal and persistent champion of HIE and HIT adoption; the champion messages can be directed to the public, providers, plans, and pharmacies.
- Provide a road map and plan that will lead to using HIE services for state employees.
- Leverage the power of the state as a payer (e.g., state employees and Medicaid) to create incentives for HIT adoption and advance the development of state-level HIE through participation in state-level HIE services.
- Convene stakeholders to guide the state's efforts to implement the HIE service and advise the state and other stakeholders on strategies to overcome barriers to adoption.
- Work with state medical societies to provide education to physicians on the HIE service to help drive adoption.

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[6] www.caqh.org.
[7] Charleston Daily Mail (W.V.)/Associated Press, 10/17/06. See also "Almost heaven: eprescribing in West Virginia," *Today in eHealth Business*, 10/19/06 (http://www.aishealth.com/EHealthBusiness/101906.html).

Appendix A—Project Team

The project team for Task #2 included the following:

Victoria M. Prescott, Esq., Primary Investigator

Stephen Parente, PhD

John Glaser, PhD

Appendix B—Interviewees

When talking to several HIE leaders and organizations about who would be candidates for Task #2, we found that the same organizations kept being mentioned. After discussion, the project team, American Health Information Management Association (AHIMA) staff, and ONC agreed on the following organizations to interview for Task #2, listed in alphabetical order as follows:[8]

HealthBridge
11300 Cornell Park Dr., #360
Cincinnati, OH 45242
URL: www.healthbridge.org
Contact: Keith Hepp
Tel: (513) 469-7222 x12
E-mail: khepp@healthbridge.org

Inland Northwest Health Services (INHS)
601 W 1st Ave.
Spokane, WA 99201
URL: www.inhs.info
Contact: Jac Davies
Tel: (509) 232-8120
E-mail: daviesjc@inhs.org

New England Healthcare EDI Network LLC (NEHEN)
266 Second Ave.
Waltham, MA 02451
URL: www.nehen.org
Contact: Sira Cormier
Tel: (781) 290-1300
E-mail: scormier@csc.com

Regenstrief Institute, Inc. (RI)   and   Indiana Health Information Exchange, Inc. (IHIE)
1050 Wishard Blvd., RG6   351 West 10th St., Suite 252
Indianapolis, IN 46202   Indianapolis, IN 46202
URL: www.regenstrief.org   URL: www.ihie.com
Contact: Marc Overhage   Contact: Marc Overhage
Tel: (317) 630-8586
E-mail: moverhage@regenstrief.org

Utah Health Information Network, Inc. (UHIN)
Washington Building, Suite 320
151 East 5600 South
Murray, UT 84107
URL: www.uhin.com
Contact: Jan Root
Tel: (801) 466-7705 x202
E-mail: janroot@uhin.com

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[8] A few other projects were contacted, but some either (1) declined to participate because they thought that they were not at a point to be considered financially sustainable or (2) were not selected for participation because their projects did not fall within the parameters of the scope of Task #2.

Appendix C—Description of Findings from Interviews

The findings from the interviews conducted are summarized and categorized by type of HIE service as follows.

Clinical Messaging

Brief Description: "Clinical Messaging" is an HIE service that delivers electronic clinical results (such as laboratory test results, radiology reports, or transcribed reports) from the source system (e.g., laboratory, radiology center) to the intended recipients (e.g., ordering physician, primary care physician).

HEALTHBRIDGE:

Service Provided:

Data Sources:

- 21 hospitals (includes hospital laboratories, pathology, radiology, transcription, and registration)
- two national reference laboratories

How Delivered: Four ways:

- To the practice's electronic inbox accessed from an HIE's Web portal (which also serves as the community portal for all the hospitals)
- Via fax, if the physician requires it
- Via mail, if the physician requires it
- Directly from data source system to physician's electronic medical system (EMR) through an HL7-formatted[9] feed

When Delivered:

- Messages are sent in real time to the physicians.

Number of Physicians Using It:

- Type of Physician Using It: Any physicians can use it.
- Total Physicians in the Community: 4,400
- Number of Physicians Using It: All 4,400 are receiving results (2,100 of those use either EMR feed or electronic inbox delivery, and such EMR feed and electronic inbox use makes up 91% of all messages delivered in the region, whereas approximately 9% are delivered via fax or print).

Architecture:

Infrastructure: The HIE leverages Axolotl® software for data sharing. Centralized servers house the data in logically separate "silos" for each data source. Data sources must submit the data in HL7 format to the HIE for incorporation into the system. Fax server is also used for batch faxing for physicians who choose fax delivery.

Standards Used:

- HL7 formatted messages

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[9] Health Level Seven is an American National Standards Institute (ANSI) standard. See www.hl7.org for more details.

- All laboratory results are mapped to LOINC® standard,[10] but mapping is not necessary for this clinical messaging service.
- EMR feeds are standardized across the region.

Requirements:

Hospital or Other Data Source:
- Required to provide data in a certain standardized HL7 format from its various systems (e.g., laboratory system, pathology system, radiology system, registration system, transcription)
- Required to map laboratory results to LOINC

Physician:
- Internet access or access to one of the member hospital's portals to access his/her inbox is required.
- Physician could also elect to receive results via fax.
- Physician could also elect to receive results via mail.
- If physician elects to receive direct feed into the practice's EMR, then physician would be responsible for developing or purchasing HL7 interface from his/her EMR vendor and then maintaining that connection.

HIE Organization:
- Responsible for training physicians
- Provide 24/7 support of system and help desk

Who Pays?:
- Hospitals and other data sources pay the HIE.
- Physicians pay the HIE a small, onetime fee if electing to receive HL7 inbound feed directly into their EMR.

How Much Do They Pay?: Hospitals and other data sources pay fees to the HIE on a subscription basis. There are levels based on relative size (expenses or number of results delivered). (Note: The exact fees were not disclosed, but HealthBridge stated the hospitals were paying less than 20 cents per message delivered.)

Cost to Deliver the Service?: Undisclosed

Do Costs Exceed Revenue?: No, net income and cash flow are positive.

Market Characteristics That Make the Model Feasible:
- History of collaboration among hospitals
- Physicians practicing at several hospitals and thus receiving results from several systems

REGENSTRIEF INSTITUTE / INDIANA HEALTH INFORMATION EXCHANGE:

Service Provided:

Data Sources:
- 16 hospitals (includes hospital laboratories, pathology, radiology, EKG [text files], transcription, and registration)

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[10] LOINC is a universal standard for identifying laboratory observations developed by Regenstrief Institute and the LOINC Committee. See http://www.regenstrief.org/medinformatics/loinc/ for more details.

- Indiana State Department of Health HIV laboratory
- One regional reference laboratory

How Delivered: Three ways:
- To the practice's electronic inbox accessed from a hospital's Web portal or the HIE's portal
- Via fax, if the physician requires it
- Directly from data source system to physician EMR through an HL7 feed (still in testing phase)

When Delivered:
- Messages are sent in real time to the physicians.
- 11.5 million results are currently stored.

Number of Physicians Using It:
- Type of Physician Using It: Any physicians can use it.
- Total Physicians in the Community: 3,600 physicians in Indianapolis metropolitan area. However, use has now expanded to the eight surrounding counties.
- Number of Physicians Using It: 3,520 physicians (1,200 practices). Approximately 90% of messages are delivered via electronic inbox and approximately 10% by fax.

Architecture:
Infrastructure: The HIE leverages the Regenstrief's DOCS4DOCS® software for data sharing. Data sources must submit the data in HL7 format to the HIE for incorporation into the system. Fax server is also used for batch faxing for physicians who choose fax delivery.
Standards Used:
- HL7 formatted messages
- All laboratory results are mapped to LOINC by Regenstrief, but mapping is not necessary for this clinical messaging service.

Requirements:
Hospital or Other Data Source:
- Required to provide data in HL7 format from its various systems (e.g., laboratory system, pathology system, radiology system, registration system, EKG, transcription)
- Required to provide updated physician lists from each source system periodically
- Provide physicians access to the HIE via the hospital's portal, but physicians can log in to the HIE's own portal if the hospital declines to provide access or if the physician prefers

Physician:
- Internet access or access to one of the member hospital's portals and a common Web browser like Internet Explorer to access his/her inbox is required.
- Physician could also elect to receive results via fax.
- If physician elects to receive direct feed into the practice's EMR, then physician would be responsible for developing or purchasing HL7

interface from his/her EMR vendor and then maintaining that connection. Again, this is still in testing phase.

HIE Organization:
- Responsible for training physicians and configuring their system
- Responsible for keeping physician list file updated daily
- No master patient index necessary
- Provide 24/7 support of system and help desk
- Responsible for continued expansion of HIE by subscribing new data sources

Who Pays?: Hospitals and other data sources pay the HIE for delivery of results.

How Much Do They Pay?: Hospitals and other data sources pay fees to the HIE based on a certain fixed fee per message delivered. This is a tiered scale with volume discounts, that is, lower fee per message delivered for higher volumes. A nominal, onetime start-up fee is also charged. (Note: The exact fees were not disclosed, but IHIE stated the hospitals were paying substantially less than the 81 cents per message that they were incurring prior to the HIE. The 81 cents was an average across all the major hospitals in the community).

Cost to Deliver the Service?: Undisclosed

Do Costs Exceed Revenue?: No, but they are about equal.

Market Characteristics That Make the Model Feasible:
- History of collaboration among hospitals
- Physicians practicing at several hospitals and thus receiving results from several systems

INLAND NORTHWEST HEALTH SERVICES:

Service Provided:

Data Sources:
- 34 hospitals (includes hospital laboratories, nursing notes, medications, images, and other inpatient data, as well as emergency room and outpatient clinic data)
- Two regional reference laboratories
- One regional imaging center

How Delivered: Three ways:
- Directly from data source system to physician EMR
- Through Web portal (physician logs on and views his/her patients' results)
- Wirelessly within hospitals downloaded to physician PDAs

When Delivered:
- Messages are sent periodically (batched) to the physicians' EMRs.

Number of Physicians Using It:
- Type of Physician Using It: Used by primary care providers and specialists, including physicians and clinical staff
- Total Physicians in the Community: 1,100 physicians in Spokane county or 2,000 if you include the surrounding area. Note: about 20% have EMRs, but the percentage is growing rapidly.

- Number of Physicians Using It: 300 physicians (about 20 practices) are using HL7 messaging to receive clinical data directly into their EMR. All physicians in the region have access to the Web portal.

Architecture:

Infrastructure: Hospitals use Meditech™ software that is implemented and maintained centrally by INHS. The HIE leverages the Meditech software and the technology infrastructure for data sharing. Centralized servers house the data in logically separate "silos" for each data source. Data sources that do not use Meditech (e.g., reference laboratory) must submit the data in HL7 format to the HIE for incorporation into the Meditech system. Have mirror site for disaster recovery.

Standards Used:
- HL7 formatted messages
- Laboratory results are not currently mapped to LOINC, but they would like to do that in the future for other projects. The outside reference laboratory data, however, are mapped to LOINC.

Requirements:

Hospital: Required to enter primary care physician for every patient at time of registration

Other Data Source: Required to provide data in HL7 format to be incorporated into the Meditech central system

Physician:
- For EMR feed, physician is required to have an EMR, to pay for the interface to be developed or licensed from the EMR vendor, and to monitor and maintain that feed.
- If physician does not have an EMR and wishes to participate, physician would just need Internet access to log on to portal.

HIE Organization: Responsible for training physicians on portal. Provide 24/7 support of system. Must maintain a master patient index to match patient data from different sources to combine data from outside sources with data in the patient's record in the Meditech system.

Who Pays?: Hospitals pay the HIE.

How Much Do They Pay?: Not itemized separately from other health information technology (HIT) services offered for a flat fee to each hospital.

Cost to Deliver the Service?: Unknown, because the system and infrastructure are also used for other things. Very minimal effort required to maintain after initial interface setup (approximately 0.25 FTE per year).

Do Costs Exceed Revenue?: No

Market Characteristics That Make the Model Feasible:
- The fact that most of the data sources use the same software platform (Meditech)
- History of collaboration among hospitals
- Willingness by physicians to adopt EMR systems and to pay for HL7 interfaces

Sharing Clinical Data on a Patient at Time and Point of Care

<u>Brief Description:</u> *"Sharing Clinical Data on a Patient at Time and Point of Care" is an HIE service that gathers and provides electronic clinical information (e.g., patient's medical history to the extent available) from multiple sources about a particular patient when the patient presents for care.*

REGENSTRIEF INSTITUTE:

Service Provided:

Data Sources: The Indiana Network for Patient Care (INPC), Regenstrief's clinical data repository, receives more than 100 data feeds:
- More than 20 hospitals (includes hospital laboratories, pathology, radiology, EKG [text files], transcription, and registration)
- Indiana State Department of Health
- Marion County Health Department
- RxHub (PBM consortium)
- Regional reference laboratories
- Radiology centers
- Multiple physician practices
- Medicaid claims data (new and will go live with first data in about one month)
- Commercial payer claims data (several contracts have been signed and data has been received and is being evaluated for incorporation)
- Medicare (has committed to providing some data for limited purposes under a grant)

How Delivered: Two ways:
- Many hospitals may choose to have a clinical abstract (short) document automatically printed in the emergency department, triggered by the patient registration, so it can be placed in the chart of the patient.
- The full patient record (data from all data sources available) is also available by logging on to the software over a secured connection on the Internet.
- Note that access is severely limited to a specific facility; only to physicians credentialed at that facility; and limited in time to 72 hours after patient discharge or 30 days after admission, whichever comes first.

Number of Physicians Using It:
- <u>Total Physicians in the Community</u>: 3,000 physicians in Indianapolis metropolitan area. However, use has now expanded to the eight surrounding counties.
- <u>Number of Physicians Using It</u>: Physicians credentialed at the member institutions can access the system, so almost all of the 3,000 physicians have access to the system.

Architecture:

<u>Infrastructure:</u> The HIE leverages the Regenstrief software for data sharing. Data sources must submit the data in HL7 format to the HIE for incorporation into the system.

Standards Used:
- HL7 formatted messages
- All laboratory results are mapped to LOINC by Regenstrief.

Requirements:

Hospital or Other Data Source:
- Required to provide data in HL7 format from its various systems (e.g., laboratory system, pathology system, radiology system, registration system, EKG, transcription)
- Provide listing of authorized clinical users to HIE and for training users on HIPAA privacy and enforcing such policies

HIE Organization:
- Responsible for training physicians on the software
- Responsible for keeping user access updated under the direction of the hospitals
- Master patient index necessary
- Provide 24/7 support of system and help desk
- Set up, monitor, and maintain network connections with all data sources
- Set up, monitor, and maintain network connections with all data recipients

Who Pays?: No money changes hands. However, a philanthropic foundation has committed long-term funding for operations because the HIE is seen as a public good. Grants also help pay for some system support.

Cost to Deliver the Service?: Undisclosed

Do Costs Exceed Revenue?: No

Market Characteristics That Make the Model Feasible:
- History of collaboration among hospitals
- Extremely valuable information in the clinical record provided to the clinician

Medication History

Brief Description: *"Medication History" is an HIE service that electronically shares a patient's medication history obtained from multiple sources (e.g., PBMs) with the clinician or institution treating the patient. Often, this information is useful to hospitals to aid in their medication reconciliation process (required under hospital accreditation under the Joint Commission on Accreditation of Healthcare Organizations [JCAHO][11]).*

REGENSTRIEF INSTITUTE:

Service Provided: Medication history is made available to the appropriate clinicians electronically when a patient is registered at the hospital.

Type of Data: Medication history, formulary

Market Penetration: Live with one hospital. Other hospitals plan to sign up as well.

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[11] www.jointcommission.org.

Architecture:

> Infrastructure: Uses existing connections to hospitals and Regenstrief's INPC clinical data repository for some medications. Other sources of medication history are also queried, thus requiring network connections and interfaces be set up with those data sources. Requires master patient index to match patient's records from various institutions.
>
> Standards Used:
> - HL7 standardized message format

Requirements:

> Hospital: Required to provide list of users allowed to access the medication history information. Required to send registration information to HIE to verify patient is under treatment.
>
> HIE Organization:
> - Responsible for appropriately maintaining network connections for retrieving the medication history data either from a third-party data source or its own clinical data repository
> - Responsible for connectivity to the hospitals for delivery of the medication history at the point of care
> - Responsible for training on use of the software and for 24/7 support

Who Pays?: Hospitals. Could expand to physicians later.

How Much Do They Pay?: Undisclosed, but it is based on the number of medication histories pulled, retrieved, and matched.

Cost to Deliver the Service?: Leveraged existing infrastructure, network connections, and clinical data repository. Some medication history data providers charge a fee that the HIE incurs when it queries the data provider's system.

Do Costs Exceed Revenue?: No

Market Characteristics That Make the Model Feasible:
- Nothing specific required
- Applicable to all markets

ePrescribing

Brief Description: "ePrescribing" is an HIE service that automates the process for clinicians to prescribe medications for patients by electronically delivering the prescription information to the retail pharmacy or mail-order service.

REGENSTRIEF INSTITUTE:

Service Provided: ePrescribing is made available to the appropriate clinicians electronically when a patient is registered.

> Type of Data: Medication history, formulary
>
> Market Penetration: Live with one large practice
>
> Architecture:
>
> > Infrastructure: Uses existing Computerized Physician Order Entry (CPOE) software in use at community health centers.

Standards Used:
- HL7 standardized message format
- NCPDP message formats[12]
- NDC,[13] Medispan GPI,[14] and RxNORM CUI codes[15]

Requirements:

Clinician: Receives training and uses the ePrescribing system

ePrescribing Delivery Network: Responsible for delivery of ePrescriptions to retail pharmacies

PBM Network: Responsible for providing eligibility data, formulary data, and medication history

Pharmacies: Responsible for providing medication histories

Payers: Responsible for providing medication histories

HIE Organization:
- Responsible for appropriately maintaining network connections between CPOE system and ePrescribing delivery network
- Responsible for getting Regenstrief's CPOE software certified with ePrescribing and PBM networks
- Responsible for aggregating medication history data from multiple sources from NDC code level into clinically meaningful categories
- Responsible for training clinicians on use of the ePrescribing function and for 24/7 support

Who Pays?: ePrescribing delivery network pays Regenstrief a portion of the fees it receives from retail pharmacies.

How Much Do They Pay?: Undisclosed, but it is based on the number of prescriptions processed.

Cost to Deliver the Service?: Leveraged existing infrastructure (CPOE software). Staff costs to get CPOE software certified with ePrescribing delivery network. Staff costs to develop necessary medication history aggregation and message management software.

Do Costs Exceed Revenue?: No

Market Characteristics That Make the Model Feasible: ePrescribing is easier to implement when a high proportion of patients' data is available.

Quality Metrics

Brief Description: "Quality Metrics" is an HIE service that shares healthcare information among multiple data sources for the purpose of quality measurement that can support provider quality initiatives and also serve as a basis for determining incentives (e.g., pay-for-performance or pay-for-quality) to providers from payers.

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[12] National Council for Prescription Drug Programs is a non-profit ANSI-accredited Standards Development Organization. See http://www.ncpdp.org/main_frame.htm for more details.

[13] National Drug Code is required by the U.S. government for each medication. See http://www.fda.gov/cder/ndc/database/default.htm for more details.

[14] GPI is the Generic Product Identifier contained in Medispan™ classification system. See http://www.medispan.com/ for details.

[15] RxNorm is a standard nomenclature for clinical drugs. An RxNorm CUI is a concept unique identifier. See http://www.nlm.nih.gov/research/umls/rxnorm/docs/06162005/rxnorm_doco_full061605.html for details.

REGENSTRIEF INSTITUTE / INDIANA HEALTH INFORMATION EXCHANGE:

Service Provided:
"Quality Health 1st" is a central Indiana, community-wide project that supports providers' quality improvement efforts with asynchronous clinical reminders and peer comparisons, derived from administrative and clinical data, along with incentives from payers. The program will begin with primary care physicians and use nationally recognized quality measures. It will later expand to include more measures, specialists, and hospitals. This effort will provide actionable patient-level information that will be of value to physicians, provide summary information on quality performance, and encourage rewards for quality improvement, not just high quality. The HIE will combine payer claims data with its existing clinical data repository to prepare reports for payers and providers to present quality measures that will be used for monetary incentives to providers for improvements in quality.

Data Sources:
- Payers' claims data
- INPC clinical data (which encompasses the data described in Section 5.3) housed at Regenstrief
- Laboratory and other clinical data from physicians' offices

Quality Measures: The initial 36 quality measures will include the AQA[16] starter set and will be mutually agreed to by a formal measures committee consisting of representatives of providers and the health plans.

Reports Provided:
- Payer receives two reports:
  - Physician Level: Aggregate report by physician or practice with the patient deidentified. This report will include the physician's performance on each quality measure computed across all payers' patients.
  - Patient Level: For the payer's members, patient level outcomes for each approved measure along with supporting data.
- Provider will receive two reports:
  - One aggregated report showing his/her performance compared to that of his/her peers
  - One patient-specific report listing the quality measures, along with any relevant reminders for the patient

When Delivered: IHIE will deliver quality reports to providers monthly and payers quarterly.

Number of Payers Participating: Medicaid, Medicare, Anthem, MPlan, MDWise (Medicaid managed care organization). Equates to just over 50% of the lives in the regional market.

Number of Providers Participating: Estimated at 60% of primary care providers in the market (approximately 700)

Architecture:

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[16] Ambulatory Care Quality Alliance. See http://www.aqaalliance.org/ for details.

Infrastructure: The HIE leverages the Regenstrief clinical repository (INPC) for data aggregation.

Standards Used:

- Claims data will be preprocessed and converted into standard HL7 formatted messages for incorporation into the payer's repository record.
- LOINC, ICD-9,[17] CPT®-4,[18] and RxNORM codes are used for data representation and queries.

Requirements:

Payer:

- Make claims data available to the HIE
- Provide HIE with member enrollment files regularly so the HIE knows which members belong to a payer
- Payers will use the quality reports to provide incentives to providers on the basis of their improvements or maintenance of high levels of performance.

Physician:

- Provide laboratory and other clinical data on patients to the HIE on a regular basis
- Review the quality reports for accuracy and to make sure it is the correct patient
- Practice redesign to improve quality and efficiency

HIE Organization:

- Receive claims data from payers and map the data to patients' clinical records for purposes of determining quality measures
- Receive laboratory and other patient-level clinical data from the physician's office and puts the data into a usable electronic format for the purposes of inclusion in the determination of quality measures
- Provide 24/7 support of system and help desk
- Provide quality reports to payers and providers on time
- Correct any misassociations of patients with providers
- Maintain the master patient index to enable the proper matching of patient records
- Maintain provider listing and map primary care providers to individual patients

Who Pays?: Payers subscribe to the quality metric service.

How Much Do They Pay?: Per member per month fee. The fee will be established on the basis of the number of lives covered by participating payers.

Cost to Deliver the Service?: Unknown at this point

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[17] International Statistical Classification of Diseases and Related Health Problems (commonly referred to as ICD) provides codes to classify diseases and a wide variety of symptoms, etc. The ICD was published by the World Health Organization. See http://www.who.int/classifications/icd/en/ for details.

[18] Current Procedural Terminology (CPT) is a list maintained by the American Medical Association to provide unique billing codes. See http://www.ama-assn.org/ama/pub/category/3113.html for details.

Do Costs Exceed Revenue?: This program is still being developed. Funds were supplied by local foundations to pay for the start-up cost.

Market Characteristics That Make the Model Feasible:
- History of collaboration among providers
- Repository of clinical data available
- Critical mass of payers willing to participate
- Critical mass of providers willing to participate
- Quality measures that have been agreed on by the providers and the payers

Other: Note that the agreements with the payers and the providers were negotiated so that their data could be used not only for this quality reporting program but also for clinical treatment of patients and some research purposes. The concept of reusing data is discussed further in Section 3.

Status: This project is under way but is not fully implemented. Not all participants have signed all the necessary contracts, but all have given verbal approval and many are anxious to proceed. Some claims data have been made available and are being reviewed for designing the reports. This service is anticipated to be self-sustaining within two years.

Note: Other quality reporting projects that involve aggregating data across multiple payers are under way; however, this project at Regenstrief/IHIE is the only one we are aware of that combines clinical data with claims data from the payers.

Administrative Data Sharing

Brief Description: "Administrative Data Sharing" is an HIE service that shares electronic administrative information related to the payment of a claim for healthcare services (e.g., claims data, eligibility) among multiple parties.

UHIN:

Service Provided:

Type of Data: Data related to payment of healthcare claims (including eligibility request and response, claim submission, claim acknowledgement, claim status inquiry, claim status response)

Market Penetration:
- Number of Transactions: 60 million per year
- Market Share: UHIN carries about 80% of the administrative claims in Utah.

Architecture:

Infrastructure: No data are stored centrally; UHIN functions more as a central gateway. Have mirrored site for disaster recovery.

Standards Used:
- HIPAA[19] standard transaction X12 format[20]

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[19] Health Insurance Portability and Accountability Act.

[20] ANSI Accredited Standards Committee (ASC) X12 group defines electronic data interchange (EDI) transaction sets for several industries, including health care insurance. Several of the electronic transaction standards mandated under HIPAA are X12. See http://www.cms.hhs.gov/apps/glossary/default.asp?Letter=X&Language=English and http://www.x12.org/ for more details.

- Other standards agreed to by the community and subsequently mandated state uniform claim billing by law

Requirements:

Payer: Required to receive and send data that are in HIPAA standard X12 transaction format and that meet the community standard

Provider: Required to be able to receive and send HIPAA standard X12 transactions in the community standard format

HIE Organization: Responsible for appropriately routing messages, maintaining the system, and enforcing standards

Who Pays?: 70% of revenue comes from payers and 30% comes from providers for administrative exchanges.

How Much Do They Pay?: Fees are publicly available on their Web site.

- Payer pays 17 cents per claim, with a cap of $450,000 per year. (Note: UHIN processes more transactions than claims; thus, all other transactions are at no charge.)
- Clearinghouse pays 12 cents per non-Medicare claim and/or encounter.
- Hospital providers pay an annual fee on the basis of size: small, $540; medium, $2,400; and large, $6,000.
- Medical provider (physician) pays on the basis of size of practice. Range is from $120 for a solo practitioner to a $9,000 annual fee for practice with more than 100 physicians.

Cost to Deliver the Service?: Approximately $1.6 million per year operating expense

Do Costs Exceed Revenue?: No

Market Characteristics That Make the Model Feasible:

- Payers and providers with a strong interest and presence in the state
- Payers and providers have to agree not to compete on HIE
- Determining the standards requires compromise of the stakeholders

NEHEN:

Service Provided:

Type of Data: Data related to payment of healthcare claims (including eligibility request and response, authorization and precertification, claim submission, claim acknowledgement, claim status inquiry, claim status response).

Market Penetration:

- Number of Transactions: 48 million per year
- Market Share: NEHEN has 32 members, which represents 50 hospitals and nine health plans

Architecture:

Infrastructure: Uses a distributed, point-to-point communication rather than a central gateway to exchange standard transactions directly among member organizations. NEHEN software required on each member site, and each member is responsible for its own disaster recovery plan.

Standards Used:

- ANSI format

Requirements:

Payer: Required to have software installed to receive and send data in ANSI format

Provider: Required to have software installed to receive and send data in ANSI format

HIE Organization: Responsible for coordinating the pilot and production activities among members. Developing and supporting router technology to facilitate transaction exchange such as telecommunication protocols, version control, and so on. Using the ANSI HIPAA standards, NEHEN works with members to build consensus for common implementation.

Who Pays?: All participants: payers, integrated delivery systems, hospitals, medical practices, laboratory/prescription/imaging centers

How Much Do They Pay?: Onetime, start-up costs of approximately $17,000 to $63,000, plus a flat monthly membership fee regardless of how many transactions are exchanged. Membership fees are tiered according to the size of the organization since April 2007:

- Payers and integrated delivery networks: Range from $60,000 to $180,000 annually
- Hospitals: Range from $24,000 to $90,000 annually
- Medical practices: Range from $12,000 to $72,000 annually
- Laboratory/prescription/imaging centers: Range from $12,000 to $36,000 annually

Cost to Deliver the Service?: Undisclosed, but costs are allocated as follows: 27% strategic planning and member services, 33% implementations and technical support, 40% new projects and activities

Do Costs Exceed Revenue?: No

Market Characteristics That Make the Model Feasible:

- Willingness for participants to collaborate for the good of the entire healthcare community
- Large payers and providers who are willing to pay for and install software on their system

Credentialing

Brief Description: "Credentialing" is an HIE service that centralizes and shares the information necessary for clinicians to become credentialed at healthcare institutions and/or with payers.

UHIN:

Service Provided:
UHIN provides a hosted, online credentialing tool for clinicians to have one place to store the data about themselves that are required when applying to be credentialed at healthcare institutions and with payers. The clinician can push the data to a hospital, for example. UHIN has also contracted with a company to verify that all the necessary data are complete before being pushed.

Type of Data: Data about the clinician (e.g., name, address, unique physician identifier number (UPIN), academic degrees, board certifications)

UHIN just began marketing this product, so it has limited subscription at this time. However, it is growing rapidly.

Architecture:

Infrastructure: The clinician's data are stored centrally. Have mirrored site for disaster recovery (leveraged from other core service).

Standards Used: The community has created a standard data set and data format (xml).

Requirements:

Payers and Healthcare Institutions: Can receive the credentialing information through the subscription service

Clinician: Required to enter his/her data into the system. Clinician then grants permission for other institutions to receive the data.

HIE Organization: Responsible for appropriately routing messages and maintaining the system

Who Pays?:

- Clinicians to enter the data and pass it to payers and healthcare institutions
- Payers and healthcare institutions that use the service to receive electronic credentialing applications

How Much Do They Pay?: Fees are publicly available on their Web site.

- Clinician pays on the basis of the size of practice. Range is from $55 for a solo practitioner to $7,500 annual fee for practice with more than 100 physicians.
- Payer pays on the basis of the number of covered lives: If fewer than 100,000, the fee is $4,000 per year. If more than 100,000, the fee is $7,500 per year.
- Hospital pays an annual fee on the basis of size: small, $450; medium, $2,000; and large, $5,000 annual fee.

Cost to Deliver the Service?: Less than $50,000 per year

Do Costs Exceed Revenue?: No

Market Characteristics That Make the Model Feasible: The bulk of the healthcare market (both payers and providers) is domiciled in Utah.

TASK #3

The Role of State Medicaid Programs and Their Involvement with Health Information Exchange Initiatives

Table of Contents—Task #3

1 Overview of Task #3 Scope

Task*: Explore the role of state Medicaid programs and their involvement with health information exchange (HIE) initiatives.*

The Office of the National Coordinator for Health Information Technology (ONC) contracted with the Foundation of Research and Education (FORE) of the American Health Information Management Association (AHIMA) for a series of follow-on reports to their Development of State-Level Health Information Exchange Initiatives project. Avalere Health (Avalere) was contracted to complete Task 3 of this work, the objective of which is to explore the role of state Medicaid programs and their involvement with HIE initiatives.

Avalere conducted interviews with:
- Nine HIE initiatives represented on the AHIMA Steering Committee;
- Five additional HIE initiatives from the AHIMA candidate list;
- Two state Medicaid officials;
- Four representatives from a regional Centers for Medicare and Medicaid Services (CMS) office; and
- One representative from the Center for Medicaid and State Operations (CMSO).

Appendix A contains the full list of interviewees, their organizations, and relevant contact information.

Appendix B lists the Avalere Health project team.

Appendix C is a copy of the HIE interview guide.

2 Background on Medicaid

Established in 1965 under Title XIX of the Social Security Act, Medicaid finances health and long-term care services for more than 55 million low-income children and adults, including the elderly and individuals with disabilities. Each state operates its own Medicaid program with flexibility in benefit design and payment; as a result, there are substantial differences in how state Medicaid programs are structured and implemented nationwide. The federal government provides states with matching funds and through the CMSO oversees state operations. The federal portion of Medicaid's 2004 operating expenditures totaled just over $172 billion.[1]

Over the years, Medicaid has become one of the states' largest budget items, a trend that has raised much concern and is not expected to wane in the near term. Demographic changes, including growing numbers of uninsured, disabled, and elderly Americans, suggest continued increases in Medicaid enrollment and use. Consequently, Medicaid remains the focus of intense scrutiny from state and federal governments alike.

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[1] Kaiser Commission on Medicaid and the Uninsured, 2004 Medicaid Tables (CMS-64), Table 1, *Federal and State Share of Medicaid Expenditures, FFY 2004.*

As states struggle to provide high-quality healthcare services to an expanding population, they use a variety of reform mechanisms to manage costs and improve efficiencies under growing budget constraints. States rely on the overall flexibility of the Medicaid program and use waivers and state plan amendments to revise their program design and alter Medicaid eligibility requirements, reimbursement rates, and benefit offerings.

Federal and congressional leaders have responded to growing concerns to address costs and sustainability issues in Medicaid. The Secretary of Health and Human Services (HHS) established a Medicaid Commission in May 2005 to issue recommendations about how Medicaid could make meaningful and lasting programmatic changes while realizing significant savings. Congress passed the Deficit Reduction Act (DRA), which was signed into law by President Bush on February 8, 2006. Section 6081 of the DRA authorizes new grant funds, known as Medicaid Transformation Grants, for states to adopt innovative methods to improve effectiveness and efficiency in the Medicaid program. Through these grants, CMS will offer $75 million in fiscal year 2007 and another $75 million in fiscal year 2008. States may propose grant projects that seek to improve Medicaid's effectiveness in several areas, including improving patient safety and reducing medical errors; advancing adoption of health information technology (HIT), such as electronic health records (EHRs) and electronic prescribing; and reducing fraud, waste, and abuse.

Despite a set of federal initiatives to modernize Medicaid's information technology infrastructure, most states continue to operate a patchwork of dated legacy systems, referred to as the Medicaid Management Information Systems (MMIS). MMIS are used to manage patient information, support the transmission of claims data, and adjudicate claims. The federal government offers states significant matching funds,[2] referred to as Federal Financial Participation (FFP), to modernize and upgrade MMIS. States regularly tap into these funds but rarely make significant changes to their systems. Most MMIS today do not offer functionalities, such as provider-accessible EHRs, that address issues ancillary to Medicaid's core administrative needs (e.g., claims processing). CMSO is working to establish a framework for modernization of MMIS through the Medicaid Information Technology Architecture (MITA) initiative. This initiative is intended to implement IT standards and promote IT interoperability in state Medicaid programs, yet a full rollout of MITA into state Medicaid programs is not expected for at least five years.

Although Medicaid systems house a robust set of administrative data, only recently is a small set of states beginning to consider how HIT could bring enhanced utility to these data and generate increased efficiencies, cost reductions, and greater access to higher quality care for Medicaid beneficiaries. Both the recommendations from the Medicaid Commission and the grants that CMS accepts have the potential to help states reform their Medicaid programs through the use of HIT. The following sections examine Medicaid's role in HIE initiatives nationwide, consider the barriers and drivers to their engagement, identify potential opportunities and value for Medicaid's participation, and present a set of recommendations for key HIE stakeholders to facilitate change and promote Medicaid's participation.

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[2] The federal government contributes 90% to the cost of MMIS design, development, and implementation and 75% for system operations and maintenance.

3 Medicaid Engagement in HIE Initiatives

The automated exchange of health information across care settings is expected to yield numerous benefits to an array of stakeholders. A mechanism to increase the safety and quality of care, HIE can increase access to information at the point of care, offer greater continuity and care coordination, and reduce medical errors and redundancies in delivered services. The use of HIT and more consistent exchange of health information can also help generate a better understanding of health outcomes for specific populations, and Medicaid beneficiaries are no exception.

However, the research and interviews conducted for this project confirm that state Medicaid agencies currently have limited involvement with HIE initiatives. This section discusses the findings from the HIE initiatives' perspective in more detail, including the ways in which Medicaid is and could be involved, the benefits of HIE, the value of Medicaid's involvement, and factors in the political environment that foster or hinder Medicaid's engagement in HIE.

With an overarching goal of improving quality of care through electronic exchange of health information, hundreds of HIE initiatives have emerged across the country. HIE initiatives possess their own unique goals and priorities but typically engage a broad array of stakeholders including physicians, hospitals, health plans, employers, consumers, laboratories, and state government. Although many initiatives may solicit representation from the state (e.g., governor's office or HHS), few to date have actively engaged Medicaid as a stakeholder. Consequently, almost all HIE initiatives interviewed have sought some type of Medicaid involvement, but few have successfully engaged Medicaid in their HIE initiative beyond an advisory role.

Regardless of low participation rates, many HIE initiatives see value in working with Medicaid and expect its involvement to have a positive effect. Interviewees frequently cited a shared focus on quality promotion and cost reduction and Medicaid's prominence as the largest healthcare purchaser for low-income and vulnerable populations as key factors underlying the desire for Medicaid participation.   Interviewees also emphasized the positive effect of Medicaid's involvement through greater access to data, an increased emphasis by the HIE on vulnerable populations, access to new and alternative grant opportunities (e.g., transformation grants), and heightened visibility and credibility for the HIE.

Medicaid's type and intensity of involvement in HIE initiatives today varies significantly. Medicaid can play many roles for an HIE initiative, such as a data source for either or both administrative and clinical data (e.g., claims or laboratory data), and a data recipient. In some current initiatives, the Medicaid agency serves in an advisory capacity through involvement in a governing board, workgroup, or other committees. In this capacity, Medicaid represents a large state payer and can also advocate for the unique needs of its beneficiaries. Some HIE initiatives have only begun their outreach to Medicaid to inform the program of the initiative's activities, whereas others have been attempting to build a relationship with Medicaid for some time. Most, however, have only recently established a connection. For many initiatives, assisting their Medicaid program in preparing Medicaid transformation grant applications was the first targeted encounter with Medicaid. In many cases, interviewees hope these grants will be the tipping point to establish and solidify a formal partnership with Medicaid.

In some states, external state government factors set the stage for Medicaid involvement in HIE,

often facilitating the process for HIE initiatives to engage Medicaid directly. For example, in similar fashion to the president's Executive Order calling for widespread, interoperable EHRs for all Americans by 2014, a growing number of governors have issued Executive Orders making HIT adoption and HIE a priority in their states. Several state legislators who understand the potential benefits of HIE have appropriated funds to promote HIE and have even encouraged Medicaid to increase its investment in HIE (e.g., in one state, representatives called for continued HIE adoption when it produced cost savings in the previous year). In addition, states with prominent Medicaid directors who are focused on quality improvement initiatives have less difficulty understanding the HIE initiatives' potential benefits and value proposition for Medicaid and are more willing to engage.

These same political forces can also can promote or inhibit Medicaid's participation over time. Several interviewees who were involved with Medicaid through changes in political administrations found that this forced turnover can yield new HIE champions or remove existing proponents. The budget cycle can also alter the relationship between Medicaid and HIE initiatives. For example, if budget constraints increase, and HIE involvement is perceived as requiring additional resources, the partnership may be jeopardized; however, if HIE is seen as a mechanism that generates cost savings, the relationship between Medicaid and HIE initiatives may be improved.

4   Barriers to Medicaid's Engagement

As previously discussed, there are many roles Medicaid can play in HIE initiatives and many ways that Medicaid can bring and receive value by engaging; however, enormous barriers stand in the way. For most Medicaid agencies, their first priority is managing their programs and their ever-growing patient populations in a cost-constrained environment. New investment in technology and initiatives focused on improving care delivery (through external partnerships or other means) that cannot clearly identify a value proposition and clear return on investment for Medicaid are not an immediate priority. This section describes the range of barriers to HIE involvement and the different perceptions of these barriers from both HIE initiatives and Medicaid representatives.

HIE initiatives have a general appreciation for the operational constraints facing Medicaid programs across the country and realize they represent significant challenges that must be overcome to engage Medicaid as a vested stakeholder. Although some of these barriers are hurdles HIE initiatives must manage with any stakeholder, many were perceived as issues unique to Medicaid agencies.

The following list is a synthesis of the key barriers identified through the interviews with HIE initiatives:
- Navigating agency bureaucracy is difficult.
- Medicaid's decision-making processes and contracting mechanisms are confusing and often arcane.
- Medicaid agencies seem fragmented and siloed in their organizational structure.
- Legacy systems are cumbersome and often difficult to manage.
- Political turnover in states directly affects Medicaid agency leadership and often stifles progress in trust building and education.
- Medicaid agencies are risk averse and extremely protective of their beneficiaries' information.

- Many Medicaid agencies are very conservative in their interpretation of federal and state privacy and security laws.

Both Medicaid and HIE interviewees agreed, however, that most Medicaid agencies have yet to see a proven value proposition for engaging with HIE initiatives and that Medicaid is heavily focused on its day-to-day operational responsibilities (e.g., paying claims and ensuring access to providers for Medicaid beneficiaries), which limits their ability to focus or commit resources to activities not primary to their mission.

4.1 Medicaid's Leading Priorities

Medicaid interviewees strongly agree that Medicaid has a different set of priorities. As mentioned, their fundamental responsibility is to provide services for a distinct population and to do so under an ever-tightening budget. Although HIE projects have the potential to help support this population, if HIE initiatives are unable to advance the mission and priorities of Medicaid or are viewed as shifting Medicaid's focus away from addressing these issues, interviewees felt that Medicaid should not be involved. However, given that so many initiatives are relatively immature and do not have sustainable revenue models, Medicaid interviewees see involvement with these unproven programs as risky and are hesitant to engage.

4.2 Medicaid's Financial Constraints

Under pressure to contain costs, Medicaid agencies typically have limited staff and financial resources to contribute to what may be perceived as external technology initiatives. In addition, they often must maintain budget neutrality throughout any new investments. Given the financial investment required to receive the FFP match combined with the unknown return on investment (ROI) of participating in an HIE initiative, state Medicaid agencies are challenged to justify the up-front investment of resources, both staff and financial. Interviewees from Medicaid leadership and HIE initiatives alike acknowledged these issues and viewed them as a substantial challenge.

4.3 Lack of HIE Champion

Lack of an HIE champion and insufficient political will to engage in an HIE initiative significantly affect a Medicaid agency's successful participation in more advanced HIE. Several Medicaid interviewees acknowledged that their effective participation in HIE was heavily influenced and dependant on their pro-HIT leadership. However, according to several state Medicaid and HIE initiative interviewees, this lack of political will can often be traced, in part, up to national Medicaid leadership.

4.4 National Medicaid Leadership

Interviewees attribute the absence of individual state Medicaid programs in state-level HIE to the lack of national Medicaid leadership (e.g., CMS, HHS). They stressed that national leadership does not see HIE or HIT adoption as core to Medicaid's mission. Rather, the national office focuses on quarterly spending issues, which sends a message to states that current operations are the priority.

Several interviewees also indicated that federal leadership sends mixed and sometimes conflicting

messages about what kind of data sharing might be permissible under Medicaid. Some HIE initiatives identified legal barriers to exchanging Medicaid beneficiary information with non-Medicaid providers. Given the frequent turnover among Medicaid beneficiaries, as individuals shift in and out of Medicaid eligibility, this becomes an even more relevant and acute issue.

Despite the perceived lack of HIE focus from national leaders, there are several HIE proponents in CMS, CMSO, CMS regional offices, and local Medicaid programs. Unfortunately, individually, many are not in the position to create sweeping change in Medicaid. In addition, these proponents may cycle in and out of their positions, increasing the challenge to promote change in any one area of Medicaid. To date, there are relatively few regular forums for these individuals to collaborate and communicate consistently with HIE initiatives, yet many of the Medicaid interviewees remain optimistic about the benefits of HIE and the development of a strong value proposition for Medicaid to engage in HIE.

5   Finding a Value Proposition for Medicaid

Almost all interviewees agreed that for Medicaid to see the direct benefit of HIE, these initiatives must address specific business problems that Medicaid faces today. Interviewees from state-level initiatives and state and national Medicaid leadership suggested an initial set of HIE target areas that focus on potential benefits for Medicaid in cost containment and quality improvement through care coordination program integrity and physician participation. A commonly accepted premise in the value proposition for HIE is that financial benefits often do not accrue equally to all stakeholders and often may disproportionately benefit payers more than others. In identifying value propositions for Medicaid, one of the largest healthcare plans in many states, highlighting enhanced benefits to Medicaid as a payer may underscore the value to the agency. This section further discusses specific areas with great potential benefit to Medicaid and those that may most effectively illuminate the value proposition for Medicaid programs.

5.1   Care Coordination

The exchange of electronic patient information and access to patient medication histories can facilitate better information at the point of care for physicians and more comprehensive care coordination and higher quality care for Medicaid beneficiaries. Subgroups of the larger Medicaid population (e.g., dually eligible beneficiaries—those who receive coverage from both Medicaid and Medicare—and the disabled) tend to have multiple comorbidities and are often transient. As a result, they often see multiple providers, including their primary care physician and several specialists. These providers can be geographically dispersed and operate in a paper-based system, yielding inaccurate or partial patient information at the point of care. This information gap can lead to redundancies, inappropriate care, and medical errors that yield poor quality outcomes and more costly care if left unaddressed. HIE could help to narrow this gap.

5.2   Cost Containment

HIE also has the potential to contain costs, a clear priority for most state Medicaid agencies. The use of electronic records as opposed to paper-based records is one cost-saving example. EHRs can minimize the need for physical space to store paper charts, enable more timely submission of

reports and diagnostic results, reduce the need for follow-up by administrative staff, and reduce duplicative tests. However, some critics would argue that regardless of the potential for long-term cost savings that HIE can bring to Medicaid, the initial cost to invest in HIE would remain prohibitive.

5.3   Fraud and Abuse

Medicaid programs across the country continue to struggle with detecting and managing fraud and abuse, such as inappropriate billing patterns, within their systems. The use of HIE can aid in the detection and prevention of fraud and abuse, particularly if claims and clinical data are accurately linked. For example, participating in an HIE initiative would enable Medicaid agencies to detect and identify "doctor shoppers" and "drug seekers" or individuals who are redeeming prescriptions from multiple physicians and who are abusing the system and posing harm to themselves. EHRs may also be used for audit purposes and could streamline program integrity review processes. By more effectively understanding these activities and patient behaviors, Medicaid programs would be able to support targeted interventions with beneficiaries and providers to strengthen the integrity of the overall program.

5.4   Physician Participation

Medicaid beneficiaries' access to providers is critical to Medicaid's ability to provide and ensure high-quality care. However, several state Medicaid programs struggle with retaining sufficient numbers of providers. Medicaid involvement with an HIE has the potential to promote physician participation and retention. Through EHR-focused projects, HIE initiatives can give providers ready access to information on Medicaid beneficiaries at the point of care and can streamline Medicaid's administrative and claims processes, which can facilitate provider payment. HIE initiatives also have the potential to help align Medicaid's claims systems with other payer systems regularly used by providers.

6   Mechanisms to Increase Medicaid Involvement in HIE

Interviewees identified several vehicles in place today that can facilitate Medicaid's involvement in HIE initiatives, including transformation grants, waivers, IT infrastructure initiatives, managed care and disease management initiatives, and CMS-focused quality initiatives. Some activities generated more interest among interviewee stakeholder groups and provide the opportunity for Medicaid to collaborate with ongoing activities in a new way, whereas others may facilitate Medicaid engagement over the longer term. This section will discuss these opportunities in more detail.

6.1   Medicaid Transformation Grants

As referenced earlier in this report, Medicaid Transformation Grants are considered a popular and new strategic opportunity for HIE initiatives to work with and on behalf of state Medicaid programs. Of the more than 165 applications submitted to CMS, more than half are estimated to include HIT components. Some proposed projects include promoting electronic prescribing, developing electronic medication profiles, and facilitating the use of broadband activity in rural areas.

6.2   Waivers

Although states do not have demonstration authority outside of waivers, they may use waivers specifically to support investments and participation in HIE. Waivers are a mechanism for states to propose and implement alternatives to standard benefit design, cost sharing, and eligibility requirements. However, waiver proposals must be budget neutral and incur no new net cost to the Medicaid program. Section 1115, on research and demonstration projects specifically, test policy innovations that are likely to further the objectives of Medicaid programs. Waivers could be used to support HIE investment and implementation costs where there is demonstrable, positive ROI. States, however, have not yet taken advantage of this creative opportunity.

6.3   MMIS and MITA

FFP associated with the development, implementation, and maintenance of MMIS is one opportunity in which states can receive financial assistance with their investments. MITA specifically provides a framework that states should use when designing and procuring new systems to ensure interoperability with other entities. Upgrading systems by using MITA principles, the state Medicaid program would receive up to 90% FFP. Although these funds could improve Medicaid's IT infrastructure, with appropriate design changes, they could also facilitate their participation in an HIE initiative. Matching funds may be enticing to some Medicaid programs; however, this approach may not be feasible for programs that still struggle to secure the necessary capital for the FFP.

In addition, although the MITA framework holds potential to modernize Medicaid's IT systems and incorporate clinical data components, the framework is still under development, and it will likely be at least five to eight years before the framework is complete and ready for broad implementation. Although some states are early adopters of initial components of the MITA framework, they are unlikely to realize benefits or cost savings until much further into the future. The current level of involvement and progress varies by state.

6.4   Leveraging Current Contracts

States could also use the existing technological infrastructure and construct their contracts to foster HIE. States with high managed care penetration or disease management contracts or those where outside contractors implemented HIE demonstration projects could work with these contractors to engage in community-based HIE and leverage their experience through new programs that target Medicaid beneficiaries. Partnering with managed care, for example, would also allow state agencies to use data for pay-for-performance programs, programs that are not widely established in fee-for-service Medicaid.

6.5   Collaboration around Dually Eligible Beneficiaries

State Medicaid agencies may also collaborate with the Medicare program and leadership to focus on quality of care for dually eligible beneficiaries. One way is through Programs of All-Inclusive Care for the Elderly (PACE). Discussions around Medicare's approach to HIE cite differences with Medicaid's approach. Medicare addresses the issues as part of a dialogue around quality, whereas

Medicaid frames it as standards and interoperability. Ultimately, Medicaid may choose to replicate demonstration programs currently under way in Medicare.

6.6 Medicaid as a Partner with the Medicare Program

CMSO, in its August 2005 memo on the Medicaid/State Children's Health Insurance Program Quality Initiative,[3] states that it will work with partners to promote the use of HIT. Specifically, CMSO indicated that it would join the CMS Quality Council HIT Workgroup to develop models for states to invest in HIT. Moreover, the Division of Quality, Evaluations, and Health Outcomes was charged with compiling information for and providing technical assistance to states on HIE. This is a new division, however, and to date CMS has focused first on issues related to quality performance measures, not HIE. Fostering transfer of knowledge across states on HIE remains a priority for the division, but more time is needed to see how the division will address it specifically.

7 Recommendations

This section presents recommendations on how HIE initiatives and Medicaid can address the barriers and challenges described throughout the report and work together to advance HIE. These recommendations, which target HIE initiatives, Medicaid agencies, and CMS, are based on interviewee and AHIMA Steering Committee input and contractor expertise and are not prioritized. Some recommendations can be achieved in the short term, but others will require action over the longer term.

7.1 HIE Initiatives

Interviewees from HIE initiatives and state Medicaid agencies alike cited the lack of a sufficient business proposition as a major barrier to Medicaid engagement. Short-term recommendations focus on selecting projects for Medicaid collaboration that are well suited to the needs of both parties. Long-term recommendations direct HIE efforts toward participation in state Medicaid planning activities.

Short Term
- Identify successful HIE case studies and begin to identify best practices for the principles of HIE as they relate to Medicaid
- Explore what Medicaid needs from an HIE initiative
  - Develop and target value propositions that fit with Medicaid's top business needs or reform priorities
- Develop HIE champions within Medicaid agencies
  - Engage early, educate Medicaid leadership and staff, be persistent, and collaborate
- Include Medicaid leaders in HIE initiatives' governance, planning, and leadership activities
- Pursue assistance and support from the governor and legislators
- Enlist the support of physician leaders and HIT champions to articulate how Medicaid's involvement in HIE initiatives could increase physicians' willingness to work with Medicaid

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[3] www.cms.hhs.gov/MedicaidSCHIPQualPrac/Downloads/qualitystrategy.pdf.

- Successful engagements should:
    - Meet the needs of both parties
    - May start with more discrete, targeted projects (e.g., medication lists, electronic prescribing, laboratory data) before expanding to widespread data exchange supporting Medicaid beneficiaries
    - Focus on what will be most readily understood by Medicaid
    - Build a case on the basis of previous success and demonstrated ROI

Long Term
- Promote and position the benefits of HIE in the context of the state's overall health goals, programs, and needs to increase buy-in for Medicaid's involvement in HIE
- Demonstrate ROI to show HIE cost savings and/or efficiencies for Medicaid
- Demonstrate how Medicaid involvement is critical to coordination of care and long-term care
- Monitor and report on the results of transformation grants that promoted HIE

7.2 State Medicaid Programs

These recommendations push state Medicaid programs to use and leverage existing relationships and infrastructure to lay the groundwork for further and future investment in HIE. Long-term recommendations suggest working with external stakeholders. Additional initiatives like MITA may require additional time for development before they are truly suitable and offer direct benefits and opportunities for Medicaid to work with HIE initiatives.

Short Term
- Explore managed care and disease management organizations and programs as levers to increase HIE engagement and use of HIT
- Explore potential to participate in demonstration programs or develop demonstration-like programs to test HIE in Medicaid
- Consider collaboration with other states that share Medicaid contractors engaged in private-sector HIE

Long Term
- Work with the state to identify and articulate state needs and to coordinate HIE interests across state programs and agencies
- Work with CMS and other state agencies on shared priorities for underlying HIE capabilities
- Look for opportunities where HIE could facilitate collaboration across agencies
- Use MITA to incorporate HIE initiatives into MMIS upgrades
- Collaborate with CMS to develop a more coordinated Medicaid/Medicare HIE strategy to better manage dually eligible beneficiaries

7.3 CMS

Recommendations to CMS call on the agency to demonstrate strong national leadership by defining a clear position on HIE in and across state Medicaid programs, while also serving as a clearinghouse for information and guidance about the collaboration process.
- Issue policy statements that support Medicaid's involvement in HIE, clarify the appropriate

sharing of data, and are consistent with other agency HIE priorities

- Help develop state-based and national-level business cases for Medicaid's involvement in HIE initiatives
- Issue a policy statement that supports and defines FFP for state Medicaid investment in HIE
- Assemble a tool kit with best practices and instructions for states to incorporate HIE successfully into MMIS to receive FFP
- Create a central point of contact for HIE and Medicaid issues that could serve as a knowledge base and provide leadership
- Foster increased dialogue between Medicaid officials and staff on the topic of HIE
- Circulate best practices for legal and contracting templates that promote HIE (e.g., successful waiver applications and legal contracts)
- Explore opportunities for Medicaid to build on Medicare quality and HIE work under way (e.g., the Doctor's Office Quality—Information Technology [DOQ-IT] program,[4] the Personal Health Record [PHR] Feasibility Test,[5] and the beneficiary portal[6]) focusing on engagement of physicians working with dually eligible beneficiaries
- Examine outcomes and disseminate findings from grant programs, particularly transformation grants and MITA implementation

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[4] The DOQ-IT project is a national initiative that promotes the adoption of EHR systems to improve quality and safety for Medicare beneficiaries in small- and medium-sized physician offices.

[5] The PHR Feasibility Test is a component of a larger CMS PHR action plan that describes a number of ways that CMS can help promote the growth of PHRs and ensure that beneficiaries have private and secure access to their own healthcare information.

[6] The Medicare Beneficiary Portal (MyMedicare.gov) is an Internet portal allowing registered beneficiaries the ability to view eligibility and entitlement information, as well as enrollment information including prescription drug plans, deductible, and address of record information.

Appendix A—Interviewees

The opinions expressed by those interviewed for this project are their own and may not reflect the opinions of their respective organizations.

Arizona Health-e Connection
Contact: Eric Dean, Schaller Anderson
Tel: 602.659.1100
E-mail: eric.dean@schalleranderson.com

CalRHIO
Contact: Donald Holmquest
Tel: 415.537.6939
E-mail: dholmquest@calrhio.org

Colorado Health Information Exchange
Contact: Lynn Dierker
Tel: 303.831.4200 x212
E-mail: dierkerl@coloradohealthinstitute.org

Florida Health Information Network (FHIN)
Contact: Michael Heekin
Tel: 404.705.0973
E-mail: heekin@mindspring.com
Interviewees: Laura Rawlins, Christopher Sullivan, Carolyn Turner

HealthInfoNet (Maine)
Contact: Devore Culver
Tel: 207.430.0676
E-mail: dculver@hinfonet.org

Indiana Health Information Exchange, Inc.
Contact: Vicki Prescott
Tel: 317.257.5822
E-mail: vprescott@vprescott.com

MA-SHARE
Contact: Ray Campbell
Tel: 781.890.6040
E-mail: RCampbell@mahealthdata.org

New Mexico Health Information Collaborative
Contact: Bob White
Tel: 505.262.3361
E-mail: bob.white@lcfresearch.org

New York Interagency Workgroup on HIT

Contact: C. William Schroth
Tel: 518.402.0953
E-mail: cws05@health.state.ny.us

North Carolina Healthcare Information and Communications Alliance (NCHICA)
Contact: Holt Anderson
Tel: 919.558.9258, ext. 27
E-mail: holt@nchica.org

Pennsylvania eHealth Technology Consortium
Contact: Darlene Kauffman
Tel: 717.558.7750 ext 1446
E-mail: dkauffman@pamedsoc.org

Rhode Island Quality Institute (RIQI) Health Information Exchange Initiative
Contact: Laura Adams
Tel: 401.274.4564 ext. 3174
E-mail: ladams@riqi.org

Tennessee eHealth Council
Contact: Antoine Agassi
Tel: 615.253.7667
E-mail: Antoine.agassi@state.tn.us

Utah Health Information Network, Inc. (UHIN)
Contact: Jan Root
Tel: 801.466.7705 x202
E-mail: janroot@uhin.com

Medicaid Interviewees

Bureau of TennCare
Contact: Darin Gordon
Tel: 615.507.6443
E-mail: darin.j.gordon@state.tn.us

Utah Department of Health
Contact: Brenda Bryant
Tel: 801.538.6136
E-mail: bbryant@utah.gov

CMSO
Contact: Richard Freidman
Tel: 410.786.4451
E-mail: richard.friedman@cms.hhs.gov

CMS Boston Regional Office—Region 1

Contact: Charlotte Yeh
Tel: 617.565.1188
E-mail: charlotte.yeh@cms.hhs.gov
Additional Interviewees: Rich McGreal, Bill Taylor, Karen Walsh

Appendix B—About the Authors

The Avalere Health project team for Task #3 included:
  Gregory Fuller, Project Manager
  Madeleine Konig
  Shannah Koss
  Sheera Rosenfeld

Avalere Health is a leading strategic advisory firm in the healthcare field. The company provides strategy, research, and educational products to a range of commercial and nonprofit customers with interests in improving the healthcare system. Founded in 2000, the company was initially known as The Health Strategies Consultancy. The name was changed in 2005 to reflect the unique nature of the firm's products and services.

Avalere Health LLC
1350 Connecticut Avenue, NW
Suite 900
Washington, DC 20036
202.207.1300
www.avalerehealth.net

Appendix C—HIE Interview Guide

Interview Questions

1. How important is Medicaid involvement to the following formative activities for HIE initiatives identified in AHIMA's *Development of State-Level Health Information Exchange (HIE) Initiatives* report?

Formative Activity	Importance				
	N/A	None	Minimal	Moderate	Significant
Assessing Market Characteristics					
Identifying Champions and Key Stakeholders					
Determining the Role of the HIE Initiative					
Establishing Governance Structure					
Developing Financial Model for Sustainability, Formulating Policies, and Setting Up Operations					
Identifying Short- and Long-Term Priorities					
Reassessing Original Assumptions and Plans					

I. Medicaid Involvement in Your HIE Initiative

2. Is your state's Medicaid agency currently involved in your HIE initiative?
   ☐ Yes *(Skip to Question #6)*
   ☐ No

3. Has your organization been involved in discussions with your state's Medicaid agency regarding potential involvement in your HIE initiative?
   ☐ Yes
   ☐ No
   ☐ Unsure
   ☐ Intend to

4. Is your state Medicaid agency considered a key stakeholder for your current or future HIE initiatives?
   ☐ Yes   (Please identify why Medicaid, as a key stakeholder, is not currently involved)
   ☐ No   (Please identify why Medicaid was not identified as a key stakeholder) _____
   ☐ Lack of perceived Medicaid interest/support
   ☐ Lack of other stakeholder interest/support to pursue Medicaid
   ☐ Limited funding (by whom?)
   ☐ Unwilling to share data
   ☐ Other: _____

5. How knowledgeable are you about Medicaid and HIE in your state?
   ☐ Not knowledgeable   *(Skip to Question #25)*
   ☐ Slightly knowledgeable   *(Skip to Question #20)*
   ☐ Moderately knowledgeable   *(Skip to Question #20)*
   ☐ Very knowledgeable   *(Skip to Question #20)*

6. How knowledgeable are you about the Medicaid participation in your HIE initiative?
   ☐ Not knowledgeable   *(Return to Question #5)*
   ☐ Slightly knowledgeable
   ☐ Moderately knowledgeable
   ☐ Very knowledgeable

7. How closely do you work with the Medicaid representative in your HIE initiative?
   ☐ Not at all   ☐ Frequently
   ☐ Occasionally   ☐ Regularly

8. In comparison to other stakeholders, how well do you understand Medicaid's operations and decision-making processes (e.g., in the context of working with or engaging them as a stakeholder)?

☐ More ☐ Less ☐ The same

9. How is your state's Medicaid agency currently involved in your HIE initiative? Please indicate all that apply:

☐ Data source　What type: _____
☐ Data recipient　What type: _____
☐ Funder　　　Of what: pilot projects, infrastructure, technology, other:
_____
☐ Advisory role on HIE initiative (planning/development)
☐ Board member
☐ Workgroup/committee member:　Which committee_____
☐ Advocate/representative for Medicaid population
☐ Medicaid recipients are target population of HIE initiative/activities
☐ Other:

10. How long has Medicaid been involved in this capacity?

☐ From the outset ☐ Initial implementation (pilot)
☐ Early planning ☐ Full implementation
☐ Other

11. Why was the HIE initiative interested in Medicaid's participation?　Please indicate all that apply:

☐ Governor's Executive Order
☐ Legislative mandate
☐ Medicaid "crisis"
☐ Perceived Medicaid interest/support
☐ Medicaid identified as potential funding source
☐ Medicaid identified as potential data source
☐ Medicaid recipients identified as potential target population for HIE (e.g., chronic illness)
☐ Shared mission/priorities between Medicaid and HIE initiative (e.g., promote quality, reduce costs)
☐ Other: _____

12. Who initiated the Medicaid relationship?

☐ You or other HIE representative
☐ Representative from Medicaid agency; Please specify: _____
☐ External facilitator or convener (e.g., state); Please specify: _____
☐ Medicaid systems contractor or other external IT vendor
☐ Medicaid provider
☐ Medicaid health plan
☐ Other: _____

13. Has the nature of the Medicaid relationship changed over time?

☐ Yes (please describe why, if possible)
☐ No
☐ Unsure

14. How, if at all, has the level of Medicaid involvement changed?

☐ Increased ☐ No change
☐ Decreased ☐ Unsure

II. Medicaid and HIE: Effect and Lessons Learned

15. How has the relationship with Medicaid affected the HIE initiative? Please indicate all that apply.

Effect on HIE Initiative	Type of Effect			
	Improved/ Increased	Hindered/ Decreased	No effect/ No change	Unsure/ N/A
Availability of funding for HIE				
Pace of initiative planning, development, or implementation				
State representation on HIE initiative's board				
Visibility of HIE initiative				
Credibility with other stakeholders				
Access to patient data for HIE				
Exchange of data on vulnerable populations				

16. Given your experience, what strategies should other HIE initiatives use to engage Medicaid?

17. When should these types of activities occur?
- ☐ From the outset of the HIE initiative
- ☐ During HIE initiative's early planning and development phase
- ☐ During HIE initiative's implementation phase
- ☐ Other: _____

III. Barriers

18. A list of potential challenges to engaging Medicaid in HIE is provided below.
Given your experience, which of these challenges have been a factor for your HIE initiative?

Please indicate the severity of each potential challenge and rank the most significant ones indicated in the first column (1=most significant).

Challenge	Degree of Challenge				
	Significant		Manageable	Modest	None
	√	*Rank*	√	√	√
ROI/Value proposition					
Funding/Medicaid "crisis"					
Privacy and security					
Lack of political will					
Lack of HIE champion					
Medicaid engagement in competing/other state HIE initiatives					
Medicaid's competing priorities					
Data-sharing restrictions					
Lack of flexibility of Medicaid program/waiver					
Other: _____					

19. Given your top two barriers (identified in the first column from the table on page 3), what do you see as the key role(s) of the following stakeholders in addressing these issues?

See table on next page for list of stakeholders.

Stakeholder	Key Role for Stakeholder	
	Barrier #1	Barrier #2
CMS		

Medicaid/ Medicaid Director		
State Legislature/Governor		
Leadership/ Governance of HIE initiatives		
Federal Government/US Congress		
Other:_____		

IV. Medicaid and HIE in Your State

20. Do local markets or regions targeted by your HIE initiative have high concentrations of Medicaid recipients?
    - ☐ Yes
    - ☐ No
    - ☐ Unsure

21. Are there other HIE efforts in your state currently working with the Medicaid agency?
    - ☐ Yes   (Please explain in what way)
    - ☐ No
    - ☐ Unsure

22. Is there an "HIE Champion" in your state's Medicaid agency or state government?
    - ☐ Yes   (Please identify who and their title)
    - ☐ No
    - ☐ Unsure

23. Has your state's Medicaid agency pursued waiver options (e.g., 1115) to support HIE activities?
    - ☐ Yes (Please describe, if possible)
    - ☐ No
    - ☐ Unsure

24. How much flexibility does your state Medicaid agency have to make decisions around the following areas?

Decision Area	Degree of Flexibility				
	Unsure	None	Low	Moderate	Substantial
Investment in HIE					
Promotion of HIE					
Requiring HIE					

V. Other Federal Public Payer Structures

25. Which, if any, of the following federal public payers have played a role in your HIE initiative? Where relevant, please indicate the degree of involvement and briefly characterize its nature.

    See table on next page for list of federal public payers.

	Degree of Involvement			
Federal Public Payer	**None**	**Low**	**Moderate**	**Substantial**
Medicare				
Veterans Affairs (VA)				
Department of Defense (DoD)				
Federal Employees Health Benefits Program (FEHB)				
Other				

Nature of involvement: _____

26. What role(s), if any, should the federal government play in coordinating state Medicaid and HIE initiatives?
☐ Set standards for Medicaid information systems
☐ Require states seeking Medicaid waivers to incorporate HIT
☐ Offer incentives for states to incorporate HIT in Medicaid waivers
☐ Require state Medicaid agencies to demonstrate investment (direct or indirect) in and collaborate with local HIE initiatives
☐ Provide federal financial support for investments in HIT
☐ Address privacy and data-sharing issues
☐ Facilitate dialogue between Medicaid agencies around HIE
☐ Other: _____

VI. MITA

MITA is a CMS initiative intended to foster integrated business and IT transformation across the Medicaid enterprise. MITA will establish national guidelines for technologies and processes that can enable improved Medicaid program administration. It includes an architecture framework, processes, and planning guidelines for enabling state Medicaid enterprises to meet common objectives within the framework while supporting unique local needs.

MITA's common business and technology vision for state Medicaid agencies emphasizes:
1. Medicaid patient-centered view not constrained by organizational barriers
2. Common standards (with, but not limited to, Medicare)
3. Interoperability (between state Medicaid agencies within and across states, as well as with others involved in healthcare delivery)
4. Web-based access and integration
5. Software reusability
6. Use of Commercial Off-the-Shelf Software (COTS)
7. Integration of public health data

27. Prior to this survey, how knowledgeable were you of the MITA initiative?
☐ Not knowledgeable *(Skip to Question #32)* ☐ Moderately knowledgeable
☐ Slightly knowledgeable ☐ Highly knowledgeable

28. Is your HIE initiative involved with MITA in your state?
☐ Yes ☐ No Why not?
Nature of this involvement? ☐ Unsure

29. How do you think adopting MITA will affect each of the following?

	Hinder	**No Affect**	**Advance**
HIE in your state			
Your HIE initiative			
Medicaid's involvement in HIE generally			
Medicaid's involvement in your HIE initiative			

30. What role(s) could HIE initiatives play in advancing the adoption of the MITA framework and principles?

31. How would you characterize the level of support/political buy-in for MITA from the following stakeholders?

	Degree of Support/Political Buy-In			
MITA Stakeholder	**None**	**Low**	**Moderate**	**Substantial**
Your HIE initiative				
The state Medicaid agency				
CMS				
Other: _____				

VII. Additional Comments or Recommendations

32. Should a Medicaid official be included in the governance structure of an HIE initiative?
    ☐ Yes ☐ No   Why or why not?
    If yes, when should this happen?
    ☐ When interests of both parties align (e.g., when HIE is ready to engage Medicaid or vice versa)
    ☐ From the onset of the HIE initiative
    ☐ During HIE initiative's early planning phase
    ☐ During HIE initiative's implementation phase
    ☐ Other: _____

33. Is there anything else that you think would be helpful to know about Medicaid and HIE that was not addressed by this survey?

VIII. Background Information on Your HIE Initiative

34. Please identify the type of legal entity that best describes your HIE:
    ☐ Not-for-profit 501(c)(3) charitable organization
    ☐ Not-for-profit 501(c)(4) social welfare organization
    ☐ Not-for-profit 501(c)(6) mutual benefit organization
    ☐ Virtual HIE that is linked contractually but with no separate new entity
    ☐ Quasigovernmental entity
    ☐ State agency
    ☐ Partnership or limited liability corporation (LLC) pass-through entity
    ☐ Special joint powers authority
    ☐ Cooperative

35. What was your HIE initiative's initial priority for data exchange?
    ☐ Medication management
    ☐ EHRs
    ☐ ePrescribing
    ☐ Clinical messaging
    ☐ Long-term care
    ☐ Emergency departments
    ☐ Other: _____

36. Who are your initiative's key stakeholders? Please check all that apply.
    ☐ Hospital or health system
    ☐ Clinicians
    ☐ State government
    ☐ Local government
    ☐ Federal government
    ☐ Payers (nongovernmental)
    ☐ Health professional association
    ☐ Long-term care facilities
    ☐ PBMs
    ☐ Pharmacies
    ☐ Quality/safety organizations
    ☐ Ancillary services (e.g., laboratories)
    ☐ Consumers
    ☐ Employers
    ☐ Academia/research groups
    ☐ Vendor

TASK #4

Health Information Exchange and Quality and Transparency Initiatives: Toward Strategic and Operational Coordination

Table of Contents—Task #4

1 Overview of Task #4 Scope

Task: *Explore the relationship between state-level health information exchange (HIE) and quality and transparency initiatives.*

Deliverables:
1. Describe current efforts to integrate quality and transparency initiatives into state-level HIE.
2. Identify key principles for involving state-level HIE in quality and transparency initiatives.

1.1 Introduction

The momentum for collecting and reporting performance data about healthcare providers is accelerating. Data about quality and cost supports healthcare purchasing and contracting by employers and their intermediaries. It can also be used to help make personal choices about healthcare. Healthcare consumers are no longer passive recipients of services. They require reliable information from credible sources to inform their own choices and improve the value of the system as a whole. Because of greater consumer engagement, quality and transparency initiatives are expanding in the private and public sectors.

On August 22, 2006, President Bush signed an Executive Order supporting the promotion of quality and efficient healthcare in healthcare programs administered or sponsored by the federal government. The president requested that federal agencies implement health information technology (HIT) for the direct exchange of health information, as well as programs measuring the quality of services provided to beneficiaries or enrollees of the federal healthcare system.

During the September 12, 2006, meeting of the American Health Information Community (AHIC), Secretary Michael Leavitt asked for recommendations regarding the role of state-level HIE organizations in quality and transparency initiatives and their role and relationship to other organizations working to achieve these goals. The Office of the National Coordinator for Health Information Technology (ONC) requested that the state-level HIE Steering Committee explore this important and timely question as part of its work under the *Development of Consensus Best Practices for State-Level Regional Health Information Organizations* contract. The American Health Information Management Association's (AHIMA's) Foundation of Research and Education (FORE):
*   Surveyed the nine state-level HIEs participating in the state-level HIE project, and
*   Convened the Steering Committee for discussion of survey findings and formulation of recommendations.

Appendix A contains the full list of interviewees, their organizations, and relevant contact information. Appendix B is the survey tool, and Appendix C lists the FORE project team that administered the survey and prepared this report.

2 Survey Findings

Survey findings reveal much about the role of state-level HIEs and other organizations in quality and transparency initiatives.   However, it should be noted that this is a survey of a limited number of HIE organizations. No data were collected from any of the other organizations that are leading quality and transparency initiatives in these states.   Aside from conversations during the Agency for Healthcare Research and Quality (AHRQ)-sponsored data collection and reporting conference held November 8-9, 2006, national experts in quality and transparency did not have input into the recommendations.   The survey findings served primarily as a stepping off point for the Steering Committee discussion about how HIE organizations can best contribute to quality and transparency initiatives to serve the public good.

2.1   The HIE's Role and Authority for Quality and Transparency

All of the state-level HIEs have quality improvement as an element of their organizational mission. This is not a tangential issue; it is mission critical for these organizations.

When participants were asked to describe their organization's current or planned role in supporting quality initiatives, their responses varied from being a supplier of data for performance reporting (55%) and disease or chronic care management (33%) to reporting actual performance to purchasers or payers (33%) or the public (22%). Some see their role as advising and overseeing initiatives being managed by other entities (33%).

The authority for a quality and transparency mission and leadership role generally originates from action of the HIE's governance (66%). Action of governors or legislatures is the source of authority for some of the HIEs (33%). Authority also comes from other state agencies, public or private sources of funding, private stakeholders, or community consensus (55%).

2.2   Stakeholders Leading Quality Initiatives

When participants were asked to list all the types of organizations currently leading quality initiatives in their states, the list reveals the diversity. The most common organizations perceived to be quality initiative leaders are Quality Improvement Organizations (QIOs) (88%), health plans (88%), and hospital associations (78%). The next tier includes self-insured employers (55%), medical societies, business coalitions for health and state-level HIEs (each at 44%). Other organizations include private quality measurement and data organizations, state and local health departments, community-based coalitions, consumer advisory groups, universities, and other nonprofit provider and pay-for-performance groups (33% or less).

2.3   Coordinating Quality and Transparency and HIE initiatives

On the survey, HIE leaders confirmed the importance of coordination and suggested the following strategies at the state and local levels:

- Convene leaders from quality and HIE organizations to promote long-term working relationships, shared visions and goals, and coordinated strategies
- Have HIEs serve as neutral data suppliers to reduce redundant data collection, particularly when HIEs have clinical data
- Develop models that demonstrate the value of state-level HIEs in providing valuable data while lowering duplication of effort

- Have quality and HIE organizations agree to use nationally recognized standards and valid measures to reduce data variation and to adopt uniform privacy and security practices
- Educate stakeholders about the value that state-level HIE can bring to these efforts
- Educate consumers regarding the value of coordinating HIE and quality initiatives

2.4   Coordinating Quality and Transparency and HIE Initiatives with National Initiatives

When asked to share ideas for how state-level HIE and quality organizations might coordinate with national initiatives, HIE leaders suggested:

- Encourage collaboration between state-level HIE and the federal government to reduce data silos and encourage consolidation of data for multiple uses
- Coordinate the use of data from federal data sources (for example, Centers for Medicare and Medicaid Services, Department of Defense, Veterans Affairs, etc.)
- Have HIE initiatives participate in defining, testing, and prioritizing quality and transparency measures to fully leverage available data
- Appoint leaders from state-level HIE and quality organizations to national committees
- Align funding and initiatives to accelerate technology adoption and remove barriers
- Create incentives that reward providers who participate in HIE initiatives
- Create incentives that reward HIE organizations that execute and support quality and transparency objectives
- Establish standard quality measures and metrics

2.5   State-Level Quality and Transparency Oversight

HIE leaders were asked about the need for a state-level oversight body for quality and transparency. Responses ranged from recommending a formal multi-stakeholder body recognized by state law or Executive Order (55%) to an advisory body to encourage coordination (22%) or no separate formal entity for quality and transparency (22%). All agreed that this decision should reflect state and local characteristics. There was also consensus that whatever the organizational form, states should take responsibility for articulating healthcare performance improvement goals and for helping to educate consumers and keep stakeholders engaged and committed to the priorities.

3 Analysis and Implications

The project Steering Committee underscored that this is a critical time for HIE and for quality and transparency initiatives. They share a focus on improving healthcare through effective use of health information, and they exist to serve a public good. They are generally multi-stakeholder entities with fairly complex governance to balance stakeholder interests. And they must develop sustainable business models if they are to succeed at their missions.

Data and information are their key products. HIEs ensure that clinical data are available where needed to support patient care. Quality and transparency initiatives use aggregated information to identify cost and quality outcomes to drive performance improvement and consumer choice. The Steering Committee discussed opportunities for collaboration including:

- Engaging stakeholders

- Sound planning for data and information
- Leveraging information
- Information stewardship
- Continually improving the data and processes

Stakeholders—provider, payer, governmental and consumer stakeholders must be engaged in and shape HIE and quality and transparency governance, policy, and technology. Within the same state or locale, obviously the same stakeholders must be involved in both HIE and quality and transparency initiatives. The Steering Committee urged at minimum joint planning so planning is comprehensive—from HIE to public health and quality reporting.

Data and information planning—Although it is a simplistic model, Figure 1 shows the clusters of activities required for HIE and quality reporting. Activities 1 and 2, data capture/collection and HIE, are fundamental roles for HIEs. Patient-specific data are exchanged for patient care, but the data are not retained by the HIE. This is one of the models being tested in Nationwide Health Information Network pilots.

Some HIEs also aggregate data streams into databases for secondary uses such as reporting to public health, maintaining disease registries, and supporting research. They may set up the technology operations to be the aggregator or they may subcontract this function. State-level HIEs may subcontract to regional health information organizations or to third-party aggregators.

Figure 1. Major Data Activities
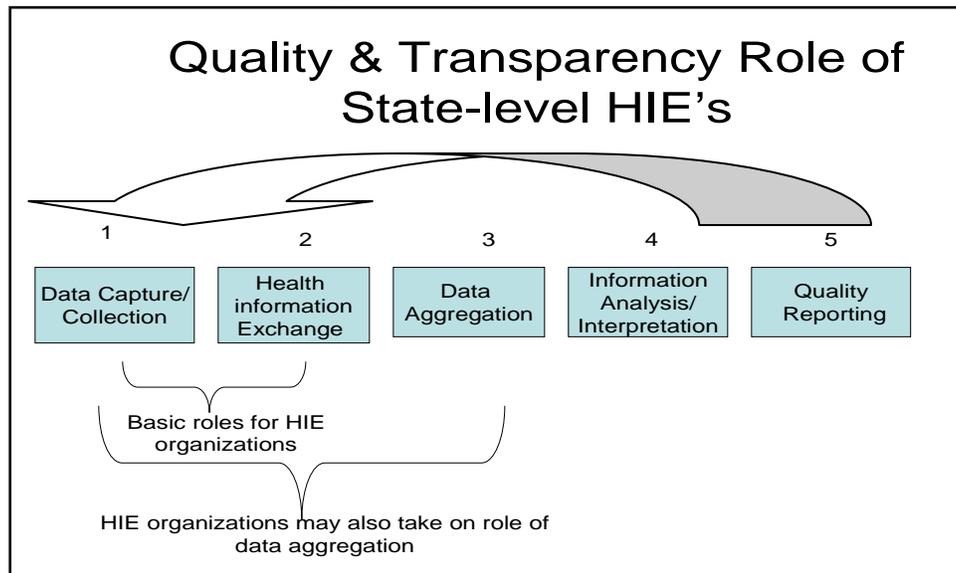
Members of the Steering Committee cautioned that the role of aggregator is not a neutral role. Data aggregation does change data, if only through structuring it into the data model and editing it for data errors. Thus, HIEs that move from exchange to exchange and aggregation take on a greatly expanded role, but one that has potential for increasing the sustainability of the HIE.

The members of the Steering Committee agreed that information analysis and reporting are generally not roles for HIE organizations. Analysis is best done by application experts. So, for example, analysis for quality reporting is performed by quality and performance measurement experts, and public health trend reports are prepared by public health experts. However, the HIE should serve as an advisor because of its knowledge of the data's attributes.

Leveraging information—This model obviously requires unified governance and planning, but it offers the potential to minimize siloed and redundant data collection, the most costly part of HIE and quality and transparency. There is also a growing cost burden for healthcare providers who must provide data to a growing number of organizations each with different reporting requirements and poorly tested and nonstandard measures.

Information stewardship—Critical data stewardship functions include security, access, attribution management, protocols for making data anonymous, data quality management, version control on terminologies and analytical tools, and so on. Siloed and redundant data increase the cost and complexity of these practices exponentially.

Continually improving data and processes—There must be an improvement loop built in so data capture, HIE, aggregation, analysis, stewardship, and reporting processes, as well as the data, are assessed and improved. The feedback loop should extend to the provider and other organizations that are the source for the data. All of these are relatively new activities for which best practices do not yet exist and standards are relatively untested.

4   Recommendations

It is very important to bring the HIE and quality initiatives into closer alignment, and the state-level HIE Steering Committee offers the following recommendations to the Secretary of Health and Human Services (HHS) and the AHIC and offers to continue this dialogue:

1. National, state, and local health IT and quality agendas are generally not now aligned, despite their shared mission of improving quality and value and their essential reliance on healthcare data to carry out their missions. HHS and AHIC should clearly articulate the need for explicit coordination between state-level HIE and state quality and transparency initiatives. To support a network of Quality and Price Information Collaboratives (QPICs) without clarifying the relationship to HIE could set back HIE.

2. State-level HIEs should support quality and transparency data requirements and be an active, funded partner in QPICs. This involvement and funding could contribute to a sustainable business model for state-level HIE.

3. A more integrated model such as that described above should be further developed and should be tested. Other emerging models that demonstrate effective coordination and collaboration between HIE and quality and transparency should also be encouraged and studied. There should be financial support and programmatic incentives (e.g., access to Medicare data) for effective governance, streamlined models for managing data, effective stewardship, and other practices that emanate from integrated planning.

4. Strategies need to be top down and bottom up. That is, HIE and quality organizations must work together on national committees such as the National Quality Forum (NQF), Ambulatory Care Quality Association/Hospital Quality Association (AQA/HQA), Agency for Healthcare Research and Quality (AHRQ), and American Health Information Community (AHIC) activities to design integrative strategies. At the same time, working relationships need to be strengthened at the state and local levels. Working from both perspectives will improve their effectiveness. The quality community must be at the table when information exchange decisions are being made, and the HIE community must be at the table when decisions are being made about data capture, exchange, and aggregation for quality.

5. Although each state must determine its preferred model for data capture and aggregation, state-level HIEs are best positioned to facilitate cost-effective access to statewide data for quality initiatives. State-level HIEs should assist with data standardization to reduce duplicate data acquisition efforts. State-level HIEs should not be responsible for establishing or enforcing quality and transparency requirements; however, HIE organizations should play a role in assisting community stakeholders with identifying, collecting, and aggregating data required for quality and transparency initiatives. This function should include establishing a definitive plan for moving from claims-based quality measurement to quality measurement that incorporates both claims and clinical data.

6. The Steering Committee recommends ongoing efforts to expand and discuss these principles further with a broader array of stakeholders in the near future. Future efforts should include:
- Conducting an environmental scan of states that have successfully integrated state-level HIE with quality and transparency initiatives
- Developing models that demonstrate the ability of state-level HIEs to share information for quality initiatives
- Developing business models that support state-level HIE involvement in quality and transparency initiatives, incorporating the long-term cost savings from reduced data variations and collection and aggregation burdens
- Discussing and clarifying the governance structures required to support the relationship between state-level HIE organizations and quality initiatives

Appendix A—Survey Participants

1. California Regional Health Information Organization (CalRHIO)
   San Francisco, CA

2. Colorado Regional Health Information Organization (CORHIO)
   Denver, CO

3. Florida's Agency for Health Care Administration
   Tallahassee, FL

4. HealthInfoNet
   Manchester, ME

5. Indiana Health Information Exchange (IHIE)/Regenstrief Institute, Inc.
   Indianapolis, IN

6. Massachusetts Health Data Consortium
   Waltham, MA

7. Rhode Island Quality Institute (RIQI)
   Providence, RI

8. State of Tennessee eHealth Council
   Nashville, TN

9. Utah Health Information Network (UHIN)
   Murray, UT

Appendix B—Survey Tool

Quality Initiatives in State-Level Health Information Exchange

In conjunction with work under HHS Contract # HHSP23320064105EC to study state-level Health Information Exchange (HIE), the Foundation of Research and Education of AHIMA is exploring the relationship between HIE and state-level quality initiatives. The information collected through this short survey will be utilized to facilitate discussions during the next project steering committee meeting on October 23 and 24, 2006. ***Please complete the survey and fax or e-mail it to the address below by October 16, 2006.***

State: Person Completing the Survey:

Organization Name:

1. Do the vision and/or mission statements of your organization contemplate a role in supporting quality initiatives?

   ☐ Yes (skip to question 1b)

   ☐ No (proceed to question 1a)

   ☐ Unknown (proceed to question 1a)

   a. If no (or unknown) was selected for question 1, does the charter for your organization contemplate quality initiatives as a future focus?

   ☐ Yes (proceed to question 1b)

   ☐ No (skip to question 2)

   ☐ Unknown (skip to question 2)

   b. If yes was selected for question 1/1a, describe your organization's current or planned role in supporting quality initiatives. (check all that apply and proceed to question 1c)

   ☐ Quality performance reporting for purchasers or payers

   ☐ Quality performance reporting for the public

   ☐ Disease or chronic care management services

   ☐ Advisory or oversight role

   ☐ Supplier of Data to quality performance reporting organization

   ☐ Supplier of data to disease or chronic care management service

   ☐ Other (please specify) _____

c. Where does the HIE's authority for quality flow from?
(check all that apply and proceed to question 2)

☐ Governor's executive order

☐ Action by state legislators

☐ Action of the HIE's governance

☐ Other (please specify) _____

2. Which organizations are currently leading quality initiatives in your state?
(check all that apply and proceed to question 2a)

☐ State-level Health Information Exchange

☐ Regional health information organizations at the local level

☐ Quality Improvement Organization (QIO)

☐ Hospital Association

☐ Medical Society

☐ Business Coalition for Health

☐ Health Plans

☐ Self insured Employers

☐ Private data analysis/quality measurement company

☐ Pay-for-performance entity

☐ Other

☐ Unknown

☐ No Current Leadership (skip to question 3)

a. For each organization selected in question 2, please provide the name of the specific organization(s) leading quality initiatives in your state. (skip to question 4)

3. If no organization(s) has yet emerged to lead quality initiatives in your state, where do you anticipate the leadership for quality initiatives will come from?
(check all that apply and proceed to question 4)

☐ State-level Health Information Exchange

☐ Regional health information organizations at the local level

☐ Quality Improvement Organization (QIO)

☐ Hospital Association

☐ Medical Society

☐ Business Coalition for Health

☐ Health Plans

☐ Self insured Employers

☐ Private data analysis/quality measurement company

☐ Pay-for-performance entity

    ☐   Other (please specify) _____

    ☐   Unknown

4. Please share your ideas for how best to integrate quality initiatives with your HIE efforts in your state. (proceed to question 5)

5. Please share your ideas for how entities or organizations overseeing state-level HIE, quality, or health care transformation efforts can actively coordinate with federal or national initiatives. (proceed to question 6)

6. What would be the ideal scope of responsibility for a state-level entity with oversight or coordination of health care transformation, including quality and HIE initiatives? (proceed to question 6a)

    a. What would be the relationship of this state-level entity to state government? (proceed to question 6b)
        ☐ Advisory body
        ☐ Supported by the Governor's office
        ☐ Formally recognized and authorized by state statute
        ☐ Comprised of state government leaders and private sector health care leaders
    ☐ Other (please specify) _____

    b. How would this state-level entity coordinate with private sector stakeholders? (proceed to question 6c)

    c. Which private sector stakeholders should be represented? (proceed to question 6d)

    d. What characteristics would make these entities similar or different from existing governance entities for state-level HIE or quality initiatives? (submit survey)

Appendix C—Project Team

The project team for this task included:

Crystal Kallem, RHIT
Manager, Practice Leadership
American Health Information Management Association (AHIMA)

Linda Kloss, MA, RHIA
Chief Executive Officer
American Health Information Management Association (AHIMA)

Eileen Murray, MM, CFRE, CAE
Vice President and Executive Director, Foundation of Research and Education
American Health Information Management Association (AHIMA)