Financing Research and Framework Development for a Health Information Exchange

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1.0 Executive Summary

The passing of the Health Information Technology for Economic and Clinical Health Act of 2009 (HITECH) has resulted in a continued increase in the number of Health Information Exchanges (HIEs) across the United States. The Pennsylvania eHealth Initiative (PAeHI) remains active in its role “to bring together Pennsylvania’s health care and business stakeholders to develop a vision and a plan for the future of health information technology (HIT) and the secure exchange of health information in Pennsylvania”. How to maintain financial sustainability is a major question raised by community, regional, and state-level HIEs. PAeHI’s 2008 White Paper titled “Building a Sustainable Model for Health Information Exchange in Pennsylvania” laid the foundation for financial sustainability discussions and actions. Recognizing its ongoing importance, PAeHI has now completed this second White Paper to further inform Pennsylvania stakeholders about HIE financial sustainability models deployed and contemplated nationally and in Pennsylvania. Key areas addressed within the White Paper include trends and demographics; approaches for thinking about sustainability; prior planning efforts by the Pennsylvania Health Information Exchange (PHIX) and PAeHI; interview findings with leaders from 11 leading national HIEs on their models and experiences; findings from 26 representatives from 13 Pennsylvania stakeholder groups; current Pennsylvania HIT/HIE initiatives; an assessment of opportunities; and a possible go-forward strategy.

National Changes in Health Information Exchange

With the passage of the 2009 HITECH Act and the Health Care Reform Act in 2010, health information exchange has received the funding and prominence needed to bring HIE exchange to a new level of activity with related initiatives to drive toward Meaningful Use of EHRs and HIEs. Key initiatives include EHR adoption incentives for hospitals and clinicians that achieve Meaningful Use goals; the formation of the Regional Extension Centers for physician adoption; expansion of workforce education and training; development of state-level HIEs; demonstration models of promising practices (Beacon Communities); and advanced research. Nationally, there are close to 250 reported HIEs in the country of which 18 are financially self-sustaining. This suggests that, finally, after several years, HIEs can be self-sustaining without grant funding and that the benefits of HIE are being demonstrated.

Impact of Pennsylvania Demographics on HIEs

Many of the state demographics support the formation and sustainability of HIEs. Pennsylvania has a large, relatively prosperous population compared to other states enabling HIEs to more easily achieve economies of scale. Pennsylvania has many medium- to large-size health systems, several with national reputations that have already achieved electronic adoption. This positions them well for data exchange. Multiple private health insurers and Medicaid cover 78% of the population with Medicaid representing 16% of the population. Medicaid and several of the state-oriented health plans have already demonstrated strong leadership in transforming health care through health information technology and exchange. This suggests several funding sources for HIEs in the state.
Other factors are more complex. There are many small hospitals in the state with 84% of total hospitals having less than 300 beds and 47% having less than 100 beds. Although small hospitals have fewer resources to become electronic and connect to an HIE, their need for HIEs with low-cost, easy-to-use solutions is significant. This is also true of the estimated 3,000 physicians in small, 1–2 physician-independent practices and approximately 2,300 physicians in rural areas. Geographies with a high percentage of small practices and rural areas typically are more challenged with initiating health information exchange.

Despite the large private insurer base in the state, the majority of the private insured covered lives are self-insured large corporations. Many of these have a national or international orientation and may not see the value in HIE as readily. The insurers of fully insured plans serve specific regions of the state, so there may be as much interest in funding local, community, and regional HIEs as in funding statewide initiatives.

Current Pennsylvania Activities in HIE

There has been a strong interest in health-care reform, health information technology, and health information exchange at the state-level since Governor Rendell established the Pennsylvania Governor’s Office of Health Care Reform (GOHCR) in 2003. Subsequently, GOHCR published a comprehensive roadmap to contain costs while improving affordability, access, and quality of health care in Pennsylvania titled “Prescription for Pennsylvania” (Rx for PA) in 2007. This roadmap identified health information exchange (HIE) as critical for improving the quality and efficiency of health care. Since then, Pennsylvania Health Information Exchange (PHIX) has developed a strategic and operational plan to implement a state-level HIE using $17.1 million in funds from the Office of the National Coordinator (ONC).

From the PHIX strategic plan, PAeHI interviews, and the formerly referenced 2008 PAeHI White Paper, we know there are many HIT and HIE initiatives around the state. In addition to PHIX, there are at least 12 HIE initiatives including hospital-based, community and regional HIEs in operation or in the planning stages. There are at least nine current and emerging initiatives related to public health. Medicaid is in the process of developing plans to engage the state health care providers and patients through PHIX. Although there are many quality initiatives in the state, four were specifically identified for excellence, national recognition, and scope.

The state has the most aggressive broadband deployment goals in the United States and plans for every city, town, and village to have access to broadband services by 2015. In 2010, six different initiatives received a total of $130.2 million in grant funding to expand broadband and telemedicine. This includes $99.7 million to establish a 1,700-mile fiber network and provide affordable broadband services across the state.

Basics of HIE Financial Sustainability

Although HIEs vary widely, there is increasing clarity on what characterizes HIEs that are on the path to sustainability or already sustainable.

*Typical participants in an HIE*—Most initial HIEs begin with data exchange between key providers that utilize common data to treat shared patients. Many of initial HIEs start with
hospitals that house the data and physicians that use the data. HIEs also include the providers along the continuum of care who can join as standalone institutions or as a network. Public health, Medicaid, and other state agencies can also connect. Nationally, more HIEs are including a personal health record as an option for patients without other solutions. Some communities and states have plans to connect to National Health Information Network (NHIN). Many other types of entities can and do participate in HIEs.

*Typical Core Functions of an HIE*—Today, most HIEs in Pennsylvania and around the country provide, plan to provide, or are considering the following core services: secure clinical messaging (the exchange of data), inquiry (the ability to look up key clinical and administrative data), a Web-based EHR and ePrescribing (for those without other solutions), public health connectivity (reportable conditions and alerts), and direct data feeds through the HIE to EHRs, databases, and registries. Some regions decided to provide Web-based EHRs and ePrescribing to ensure that physicians and small hospitals can qualify for Meaningful Use incentives. Moving in a different direction, some state-level HIEs are minimizing the core functions they are offering preferring to provide the infrastructure to move data from one HIE within the state to another.

*Typical HIE Technical Infrastructure*—Although there is no one blueprint for the architecture of an HIE, there are clear options. More narrowly focused HIEs such as provider-based personal health records can do well with a Distributed Media Model such as when a patient is given a CD by the physician to update a personal health record. A Peer-to-Peer Model is commonly used with a hospital portal providing the hospital’s patient data to physicians at remote locations such as their practice sites. Larger HIEs (such as community/regional or state-level HIEs), with many participating stakeholders, usually have a technical infrastructure with more features such as a Federated/Record Locator Service Model, a Centralized Warehouse Model, or a Hybrid Model that enable data exchange and data access across multiple organizations. The Federated/Record Locator Model and the Hybrid Model are the most popular because of the relative low cost and the minimization of political complexity that goes with a jointly shared repository in the Centralized Warehouse Model.

**Simple Framework: Comparing HIEs and Impact on Financial Sustainability**

There are three primary types of HIEs that most states are trying to reconcile: IDNs, community/regional-level HIEs, and state-level HIEs. Presumably, all three types of HIEs will coexist and can be financially sustainable if their unique differences and complementary roles are understood.

*Integrated delivery networks (IDNs)*—IDNs are usually organized by one institution such as a hospital to connect its physicians and other provider partners. Examples are Pinnacle Health System HIE and Doylestown Hospital. IDNs are growing rapidly in the state as a result of the HITECH Act. Also, hospital vendors are well equipped to set up such networks, and an IDN ensures that hospitals and physicians can participate in Meaningful Use incentive opportunities. Usually, the bulk of the costs are absorbed by the major institution.

*Community/regional HIEs*—This usually describes a multi-stakeholder data exchange, organized around one or more medical referral regions with a multi-stakeholder governing body. Fees are paid by the stakeholders based on benefits received with startup funding usually coming from
key stakeholders or outside funding sources such as grants. Some of the HIEs outsource their HIE infrastructure to other vendors or HIEs while keeping governance, outreach, and training local. Geisinger’s KeyHIE and UPMC’s HIE, the largest HIEs in the state, are blended IDN/Regional HIEs. They have the size and reach of regional HIEs but maintain many aspects of the governance and funding models of IDNs.

State-level HIEs—This describes an HIE that is defined by the state geographic boundaries, not by the naturally occurring referral region. There were few functioning state-level HIEs in the United States prior to the HITECH Act. Three known state-level HIEs are Utah Health Information Network (UHIN), Delaware Health Information Network (DHIN), and Colorado Regional Health Information Organization (CORHIO). Since the HITECH Act, all states have been funded by the federal government to plan and implement a state-level HIE with requirements to collaborate with state and federal agencies, including Medicaid and Public Health, along with other healthcare stakeholders in the state. In addition to building a data exchange infrastructure, state-level HIEs are responsible for addressing barriers to HIE adoption around privacy and security, standards, and legal issues with bordering states. PHIX has been designated as the state-level HIE in Pennsylvania.

Several fundamental factors contribute to financially sustaining health information exchange.

1. Delivery of care around Medical Referral Regions (MRRs)
2. Speed to critical mass
3. Physician participation
4. Economies of scale supported via a “low fees incurred by many” model
5. Ability to connect to disparate entities
6. Fees based on benefits received with numerous potential fee mechanism options

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<th>Community/Regional HIEs</th>
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<td>Speed to critical mass</td>
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<td>Economies of scale supported via a “low fees incurred by many” model</td>
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<td>Ability to connect to disparate entities</td>
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<tr>
<td>Fees based on benefits received and numerous potential fee mechanism options</td>
<td>✓</td>
<td>✓</td>
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</tr>
</tbody>
</table>

Table 1: HIE Comparison
The financial sustainability implications for each type of HIE vary. Sustainability for IDNs is achievable due to low costs and their natural constituencies; potential for improved coordinated care, quality, and efficiency; and high participant value and benefits. However, IDNs will have difficulty scaling over time for the bigger wins in quality and value that requires more data from external sources.

Community/regional HIEs have a natural constituency; multiple participating stakeholders; the opportunity for big gains in coordinated care, quality, safety, and efficiency; and clear benefits to each stakeholder, which can be the justification for fee income. Communities are also well positioned to receive grants, and they can scale to meet future quality and value needs of the community. Community/regional HIEs can achieve sustainability with diligent planning; however, community/regional HIEs are complex to launch because of multiple participants. Planning must include a determination of the region’s capacity to pay based on specific community/regional factors such as population, insurance coverage, patient demographics, size of hospitals and IDNs within the community/region, physician market (independent versus employed physicians and specialty versus primary care), institutional leaders, and so on.

State-level HIEs are well positioned to access and distribute state and national data from such sources as Medicaid, public health, national labs, national health plans, and more. They are a natural vehicle for state and federal funding and can serve as a vehicle for HIEs to connect to the NHIN for those providers not choosing to do so directly. They can provide direct HIE services to providers that are not otherwise served by IDNs and community/regional HIEs. In addition, the state HIE plays an important policy role in reducing the barriers to exchange. Financial sustainability models can take advantage of economies of scale and spread the costs of the HIE over many stakeholder groups. The business case is difficult to make with some stakeholders, however, who are oriented toward the community, regional, or national levels. This includes, among others, many of the providers and payers. As a result, financial sustainability for state-level HIEs requires the development of a more complex financial model that is reflective of the various stakeholder needs and takes into consideration the benefits that are also received by stakeholders through IDNs and community/regional HIEs.

**Interview Support for the Three Types of HIEs**

Interviews with Pennsylvania stakeholders (Appendix 1) confirm that there is a role for each of the three types of HIEs; there is the potential for all three to be sustainable; and with an open and transparent process, sustainability models can be developed that acknowledge the role that each type plays. Several of the interviewees recognize that IDNs will continue to grow. Most interviewees see the community/regional HIEs as the natural organizing body for HIEs because of their connection to medical referral regions and many benefits received by all stakeholders. There was near unanimous opinion that it is reasonable for all stakeholders, not just a few, to be a part of the state-level revenue model if there is benefit received. Benefits need to be more clearly articulated for each stakeholder group and the perceived value from the HIEs must be greater to or equal to their financial contribution.

Several interviewees questioned the value of the state-level entity providing a robust set of applications because this is the domain of IDNs and community/regional HIEs. A suggested
deployment strategy that supports local, regional, and state exchange is to “build from the ground up” by connecting 10–12 community/regional HIEs in a nonproprietary way and then link across the state through a common platform. This unified infrastructure (for example, utility function) was seen as the greatest benefit of the state-level HIEs (versus being an applications provider).

There were mixed opinions as to which stakeholder groups would receive the most value/benefit in the state-level HIE and therefore, their respective contributions for HIE participation. There was a consensus among interviewees that all stakeholders must be at the table when determining the sustainability models, particularly for the state-level HIE. Transparency is key.

Input from Successful HIEs Around the Nation

Eleven successful state-level and community/regional HIEs were interviewed during September 2010 (Appendix 2) to provide guidance on successful sustainability models. Five of them have been operational prior to 2003 and were sustainable. Four were started between 2006 and 2008, and two are recently operational or are planning for implementation. Of the 11 operational HIEs, four are state-level HIEs, and seven are community/regional HIEs.

Collectively, these HIEs have been successful at obtaining multi-stakeholder participation at both the community/regional and state levels. Of the 11 operational HIEs, hospitals were financial participants in 9 HIEs; physicians were financial participants in 8; and payers were participants in 6. In all cases, fees were based on benefits received, and in most cases, physicians were charged for services received. Most of the HIEs grew their HIEs organically with the physician leaders opening the doors to new participants. In many cases, the HIEs are diligent at demonstrating a favorable return on investment to participating organizations and did not undertake activities that could not provide that return.

The 4 state-level HIEs each evolved into different roles. UHIN in Utah serves as the state’s claims and clinical infrastructure. In Vermont, Vermont Information Technology Leaders (VITL) has traditionally been driven by health reform starting with the patient centered medical home model. Only recently has VITL become the state’s exchange and Regional Extension Center. In Minnesota, MN HIE provides clinicians with statewide access to clinical data for 84% of the state’s population. Michigan’s MiHIN Shared Services is limiting its role to moving data between its’ seven sub-HIEs, which includes IDNs, community/regional HIEs, and a physician-based state-wide HIE.

Go Forward Strategy— HIE Sustainability Model for Three Levels of HIE

There is a compelling case to be made that IDNs, community/regional HIEs, and state-level HIEs each play unique yet complementary roles. Pennsylvania stakeholder interviewees for this project have made it clear that all stakeholder groups are more than willing to contribute to the funding of the HIEs in the state to the degree there is benefit received. Successful HIEs across the country validate that HIEs can be sustainable and demonstrate various funding mechanisms and consensus processes to ensure success. For example health information exchange is a key component for meaningful use and in the operationalization of Accountable Care Organizations
(ACOs) and thus its services can generate revenue and contribute to its overall financial sustainability.

PAeHI is proposing that a financial sustainability HIE model be developed to support all three levels of HIEs. There should be an open and transparent multi-stakeholder process to develop the model. It should engage all stakeholder groups and ensure cross-stakeholder buy-in.

PAeHI, which already engages many of the stakeholder organizations, is an ideal organization to act as the convener of the process. Given the fast pace of the HITECH Act deadlines and current HIE activities in the state, this process should be completed within the next six months. Key steps include the following:

1. Articulate a high-level model that shows how IDNs, community/regional-level HIEs, and a state-level HIE can flourish across the state. Consider the unique issues in each medical referral region and statewide.
2. Collect market research by medical referral region and statewide in areas that need more exploration.
3. Engage stakeholders in a discussion about the model.
4. Come to general consensus on an HIE Sustainability Model for the state and next steps.

2.0 National Background

There has been an increase in interest in Health Information Exchanges (HIEs) and electronic health records (EHRs) in the past year as a consequence of the Health Information Technology for Economic and Clinical Health Act of 2009 (HITECH). All 50 states plus the territories have received funding to implement state-level HIEs. Hospitals and physicians are required to adopt certified EHRs and meet Meaningful Use requirements starting in 2011 if they are to continue to receive Medicare and Medicaid payments. Starting in 2011, hospitals and physicians will receive incentive payments for meeting adoption requirements. Hospitals can receive as little as $2 million and physicians can receive as much as $44,000 if they meet Medicare patient requirements and $65,000 if they meet Medicaid patient requirements. Regional Extension Centers (RECs), which are funded by the U.S. Department of Health and Human Services (HHS), are being established across the country to assist physicians with EHR purchase and adoption, and Beacon grants (also funded by HHS) have been distributed to communities to model promising practices for coordinated care using EHRs and HIEs. The Office of the National Coordinator (ONC) has been instrumental in providing leadership to all these national HIT efforts to “make our health care system more efficient and reduce paperwork for patients and doctors, expand access to affordable care, and build a healthier future for our nation.”

No one knows for sure how successful these efforts will be, but the national agenda has been set, and this is causing a re-alignment in the health-care industry as providers and vendors consider partners to facilitate their growth to take advantage of new opportunities. These federal initiatives are also intended to support the Health Care Reform legislation that is also impacting payers and employers.

Tied to The Patient Protection and Affordable Care Act of 2010, activity is increasing around outcomes-based quality improvement initiatives such as the Patient Centered Home (PCMH) model and the formation of Accountable Care Organizations (ACOs) that focus on payment reform, patient-centric care, workflow redesign, and data exchange to improve coordination of care. This movement to PCMH and ACO organizations puts EHRs and HIEs solidly in this formula and brings payers and providers together.

Within this context, HIEs continue to grow according to the 2010 eHealth Initiative Report, The State of Health Information Exchange in 2010: Connecting the Nation to Achieve Meaningful Use, which was released in July and based on its 2010 survey of HIEs. Currently, there are 234 self-reported HIEs in the country with many of the new ones being state-level HIEs. For the first time there are 73 operational HIEs of which 44 are not dependent on federal funding, and 18 of them are self-sustaining. The other 29 operational HIEs are dependent to some degree on federal funds. After many years of emerging HIEs, there now are enough mature HIEs to demonstrate that they can be financially sustainable.

Highlights from the report include the following:

- There is continued growth in the number of health information exchange initiatives and in those which are operational. Operational initiatives are considered those that are transmitting data that is being used by stakeholders. In 2010, there are 73 operational initiatives, up from 57 in 2009.
- Sustainability is an attainable goal for health information exchange organizations. There are a small but significant number of sustainable organizations. Of the 73 operational initiatives, there are 107 initiatives that are not dependent on federal funding, up from 71 in 2009. There are 18 initiatives that are operational, not dependent on federal funding, and have covered their expenses through operational revenue alone.
- Health information exchange initiatives do not necessarily need a financial relationship with or partially own the organizations participating in the HIE for the HIE to become sustainable. Forty-four of the 73 operational initiatives have no financial relationship with the entities involved in the initiative. Seven of the 18 sustainable initiatives have no financial relationship with the organizations involved in the initiative.
- More health-care provider organizations are reporting a reduction in staff time and redundant testing through the use of an HIE. HIEs report reduced staff time spent...
on clerical administration and filing (33); reduced staff time spent on handling lab and radiology results (30); and decreased dollars spent on redundant tests (28).

- New challenges are rapidly emerging related to federal policy and governance of HIEs. One hundred thirty-one initiatives cite addressing government policy mandates as a major challenge.

When asked about sources of revenue, the number one source reported was subscription fees or membership dues paid by data providers. The second most common source was subscription fees or membership dues paid by data users. Other sources of revenue included transaction fees charged to healthcare data users and providers and donations to the HIE. 3

![Breaking Even](image)

**Figure 1: 2010 Status of HIEs Nationally**

This report also investigated the functionalities that are used by HIEs. It found that, of the operational HIEs, the most common functionalities used from the Meaningful Use Core Items were medication data, allergy information, emergency department episodes, care summaries, laboratory results, inpatient discharge summaries, and advance directives. The non-Meaningful Use items used included outpatient laboratory results, outpatient episodes, radiology results, inpatient diagnoses, and procedures and pathology results. For more detailed analysis from this study, see Appendix 3.

### 3.0 Pennsylvania Background

#### 3.1 Demographics

**General**

An important factor in a state’s capability to support HIEs is its demographics. Demographic factors that are favorable for a state to support HIE are large, young, and

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It consists of prosperous populations; many medium to large size hospitals; several locally oriented payers with a high mix of fully insured lives and a few large self-insured employers; and a low uninsured population. Less favorable demographic factors for a state’s supporting HIE are an older population, many small hospitals, many rural areas, predominance of national health plans, and a high level of self-insured employers each with relatively few employees.

As the following sections suggest, Pennsylvania is well positioned in many ways to support HIEs.

Pennsylvania has a population of 12,286,700. It is the 6th largest state by population in the country. Its demographics suggest that it is a state with an aging population and a state that is relatively prosperous. Highlights of the state demographics include the following:

- Pennsylvania has a slightly smaller number of children under 18 and a larger number of people over age 65 than the U.S. as a whole.
- The State has a smaller number of people from various racial and ethnic backgrounds than the U.S. as a whole.
- The State has a smaller number of people living in poverty than the nation as a whole.
- The State’s median income is essentially the same as that of the U.S median income.
- The State’s population living in non-Metropolitan areas is 2% higher than the national average.

See the following table for more detailed information.

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<td>18%</td>
<td>48,866,200</td>
<td>16%</td>
</tr>
</tbody>
</table>

**Source for above data:** The Henry J. Kaiser Family Foundation State Health Facts, [http://www.statehealthfacts.org/](http://www.statehealthfacts.org/) accessed November 1, 2010

**Note:** Percentages may not sum to 100% due to rounding effects. Population and demographic data are based on analysis of the Census Bureau’s March 2009 and 2010 Current Population Surveys (CPS: Annual Social and Economic Supplements) and may differ from other population estimates published yearly by the Census Bureau. U.S. and state population data displayed on this site are restricted to the non-institutionalized, civilian (not active duty military) population; state data represent 2-year averages. The Population Distribution by Race/Ethnicity, is based on state data (2008-2009) and U.S. data (2009) and do not directly correspond to the age demographic information.

### Table 2: Pennsylvania Demographics with U.S. Comparisons

#### Health-Care Delivery

**Hospitals and Health-Care Networks:** Pennsylvania has a wealth of acclaimed hospital and health-care networks. There are 256 licensed hospitals in the State.⁴ One hundred and sixty-five of these are acute care hospitals.⁵ This compares to many states in the country that have less than 100 hospitals. Analysis of the hospital data reveals other notable statistics:

- The largest hospital in the State is UPMC Presbyterian Shadyside with 1,577 licensed beds.
- There are 17 hospitals in Pennsylvania with more than 500 licensed beds representing only 7% of the hospitals, yet these hospitals represent 28% of the beds and 31% of hospital admissions.
- There are 40 hospitals with more than 300 beds representing only 16% of the hospitals, yet account for 48% of the beds, and 52% of the admissions.
- There are 121 hospitals with fewer than 100 beds representing 47% of the hospitals, 13% of the beds, and 9% of the admissions. This includes 26 hospitals with less than 25 beds.

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The 95 hospitals with bed size of 101–300 account for the highest percentage of admissions in the State: 38.97%.

These statistics are significant. They describe an environment that is both favorable and unfavorable for HIE development. Approximately 50% of the care is provided by the 40 largest hospitals. These hospitals may be more inclined to become electronic and engage in data exchange. The largest are likely to be electronic already and have already achieved many of the gains that an HIE brings. The challenge for Pennsylvania will be with the 121 hospitals with fewer than 100 beds. These hospitals will benefit greatly from an HIE that can provide needed electronic capabilities, but these hospitals will have fewer resources to finance an HIE.

<table>
<thead>
<tr>
<th>Metric</th>
<th># of Hospitals</th>
<th># Beds</th>
<th># Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;500</td>
<td>17</td>
<td>12,313</td>
<td>574,530</td>
</tr>
<tr>
<td>301-500</td>
<td>23</td>
<td>8,926</td>
<td>406,277</td>
</tr>
<tr>
<td>101-300</td>
<td>95</td>
<td>17,377</td>
<td>733,122</td>
</tr>
<tr>
<td>26-100</td>
<td>95</td>
<td>5,591</td>
<td>148,287</td>
</tr>
<tr>
<td>25 or fewer</td>
<td>26</td>
<td>360</td>
<td>19,093</td>
</tr>
<tr>
<td>Total</td>
<td>256</td>
<td>44,567</td>
<td>1,881,309</td>
</tr>
</tbody>
</table>

Table 3: Pennsylvania Hospitals

![Figure 2: PA Hospital Comparison](image-url)
Physicians—As of August, 2010, there were 34,473 licensed MDs and 5,648 DOs in the State. In 2007 the Pennsylvania Medical Society Survey estimated that 2,300 physicians were in rural areas. In anecdotal reports, it has been suggested that, while as many as 3,000 physicians are in 1–2 person practices, as many as 50% of the physicians in the State are employed by the large health systems such as UPMC, Geisinger, Redding Hospital, Jefferson, WellSpan Health, and the University of Pennsylvania. In some parts of the state, there are few employed physicians.

These statistics are significant to the successful growth of an HIE. If there is a large percentage of independent small practices, physician electronic adoption is harder to achieve; physician adoption is essential to the success of the HIE. However the Regional Extension Centers (RECs) in Pennsylvania may be a useful resource in helping small practices to become electronic. The rule of thumb is that at least 60% adoption is needed to reach the tipping point to critical mass, which is an important marker to achieving financial sustainability for an HIE. Large practice participation is essential in engaging a large mass of physicians to use the HIE. Large practices usually have the resources to obtain and implement EMRs, and they will call on other physicians to participate in the HIE. On the other hand, smaller practices benefit greatly by participating in an HIE. With an estimated 50% of the physicians in the State employed by large health systems, many regions of Pennsylvania will be well positioned to achieve a majority of physicians having electronic capability. Yet, it is not clear that all regions will be positioned for high levels of adoption, particularly those in rural areas or communities with a high percentage of independent and small practices.

Further demographic information can be useful to understand the profile of the physician community and its impact on HIE sustainability. Key information in each of the regions and statewide follows:

1. What is the mix of employed versus independent physicians?
2. What are the total number of practices?
3. What are the sizes of the practices by specialty and primary care?
4. Further questions related to adoption include, What is the electronic adoption readiness of the practices? Which practices have been targeted by the Regional Extension Centers?
Table 4: Number of Licensed Physicians in PA

<table>
<thead>
<tr>
<th>Number of Licensed Physicians in Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDs</td>
</tr>
<tr>
<td>DOs</td>
</tr>
</tbody>
</table>

*Source: Pennsylvania State Medical Board; numbers as of 8/10/10*

<table>
<thead>
<tr>
<th>Number of Physicians in Rural Pennsylvania</th>
<th>2,300</th>
</tr>
</thead>
</table>

*Source: Pennsylvania Medical Society 2007 Survey*

**Nursing Homes**—According to Medicare’s database, there are 713 nursing homes in Pennsylvania. Only four of these homes have more than 500 beds. Most of the nursing homes are much smaller. The largest number of homes (368) falls in 100–199 bed size range. The second largest range is 8–99 with 267 homes.

<table>
<thead>
<tr>
<th>Pennsylvania Nursing Homes</th>
</tr>
</thead>
<tbody>
<tr>
<td># Beds</td>
</tr>
<tr>
<td># Homes</td>
</tr>
</tbody>
</table>

*Source: [www.medicare.gov](http://www.medicare.gov) accessed July 6, 2010*

**Laboratories**—The Clinical Laboratory Improvement Amendments (CLIA) database reveals that there are 28 laboratories in Pennsylvania that have a Certificate of Accreditation (highest given) and are classified as "Independent" laboratories. These include both of the major national laboratory providers: Quest and Laboratory Corporation of America (Lab Corp). Hospital run, local, and regional labs are natural participants in HIEs. Nationally, some regions and states, but not all, have engaged the large national labs in HIEs. See Appendix 4 for a list of these laboratories.

**Pharmacies**—There are 3,266 licensed pharmacies in Pennsylvania, according to the Pennsylvania State Board of Pharmacy 2009 license listing after renewals. Of those, 252 are hospital-based pharmacies and the rest of those, 3,014 are largely community based pharmacies. (Small numbers also include mail order pharmacies or closed-door pharmacies serving long term care facilities or prisons). Of the approximately 3,000 others, roughly 1/3 are independently owned single or small regional pharmacies and 2/3 are large chain, supermarket, or mass merchandiser pharmacies. According to SureScripts, 92% of community pharmacies in Pennsylvania have eprescribing activated.
Pennsylvania is ranked 7th in Surescripts annual Safe-Rx rankings\(^6\), which measure the level of e-prescribing activity in each state and the District of Columbia. Rankings are calculated to reflect all three critical steps in the electronic prescribing process: total prescription benefit requests and responses as a percent of the total number of patient visits in the state in 2009, total medication history requests and responses as a percent of the total number of patient visits in the state in 2009, and the number of prescriptions routed electronically (new prescriptions plus prescription renewal responses) as a percent of all prescriptions that were eligible to be submitted electronically in the state in 2009.

**Payers**—Payers are an important stakeholder group because they have a vested interest in improving the coordination of care, which is a primary benefit of HIEs, and as a result, may be interested in funding HIEs. Payers that benefit greatly from HIEs are Medicaid, private health plans, and self-insured employers. Although more investigation would need to be done to determine the number and size of the self-insured employers, the "Pennsylvania Insurance Department, 2008 Pennsylvania Health Insurance Survey Research Report" shows that Medicaid and private health plans (which would include the self-insured employers) cover 78.10% of the population of Pennsylvania. This statistic compares to 71.1% of the population nationally who are covered by these types of payers.\(^7\)

<table>
<thead>
<tr>
<th>Summary of Pennsylvania Health Insurance Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Health Insurance</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Private Health Insurance</td>
</tr>
<tr>
<td>Medicare State Sponsored (Total)</td>
</tr>
<tr>
<td>Medicaid</td>
</tr>
<tr>
<td>CHIP</td>
</tr>
<tr>
<td>Adult Basic</td>
</tr>
<tr>
<td>Military</td>
</tr>
<tr>
<td>Uninsured</td>
</tr>
</tbody>
</table>

(Percentages will sum to more than 100% due to dual coverage among some residents.)

---


Table 6: Summary of Pennsylvania Health Insurance Coverage

<table>
<thead>
<tr>
<th>Insurance Coverage of the Total Population (PA 2007-2008; U.S. 2008)</th>
<th>PA #</th>
<th>PA %</th>
<th>U.S. #</th>
<th>U.S. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer</td>
<td>6,943,100</td>
<td>56.80%</td>
<td>157,194,100</td>
<td>52.30%</td>
</tr>
<tr>
<td>Individual</td>
<td>624,200</td>
<td>5.10%</td>
<td>13,995,800</td>
<td>4.70%</td>
</tr>
<tr>
<td>Medicaid</td>
<td>1,576,700</td>
<td>12.90%</td>
<td>42,326,300</td>
<td>14.10%</td>
</tr>
<tr>
<td>Medicare</td>
<td>1,855,300</td>
<td>15.20%</td>
<td>37,183,500</td>
<td>12.40%</td>
</tr>
<tr>
<td>Other Public</td>
<td>41,800</td>
<td>0.30%</td>
<td>3,505,000</td>
<td>1.20%</td>
</tr>
<tr>
<td>Uninsured</td>
<td>1,193,200</td>
<td>9.80%</td>
<td>46,339,500</td>
<td>15.40%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>12,234,300</td>
<td>100%</td>
<td>300,544,200</td>
<td>100%</td>
</tr>
</tbody>
</table>

NOTES:
*Percentages may not sum to 100% due to rounding effects. *For current Medicaid and Medicare enrollment figures, please refer to the Medicaid & SCHIP & "Medicare" sections, respectively, which report enrollment data from the Centers for Medicare & Medicaid Services (CMS). 
*SCHIP and individuals’ eligible for both Medicare & Medicaid (dual eligible) are included in Medicaid. *Other Public (Federal) includes individuals covered through the military or Veterans Administration in federally funded programs such as TRICARE (formerly CHAMPUS) as well as some nonelderly Medicare enrollees.

Source: Kaiser Family Health Foundation
Note: State data from 2007–2008; U.S. data from 2008

Medicaid has 16% of the covered lives in Pennsylvania compared to 14.1% nationally. Medicaid has a high vested interest in participating in HIEs where it has patients, which is in communities across the entire state. It receives great benefit from data exchange because its patients receive a high level of uncoordinated care across provider organizations.

The four largest health plans in the state are Highmark, Independence Blue Cross, Capital BlueCross, and Aetna which represent 4,175,722 members. These numbers do not include self-insured plans that anecdotally represent 55% of the private insured covered lives.

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8 Pennsylvania Insurance Department Membership Data, 12/31/2009.
In Pennsylvania, Highmark is focused primarily in 49 counties in Western PA, Central PA, and Lehigh Valley in addition to its large national presence. Independence is focused on the five counties in the Philadelphia region. Aetna is primarily focused in Philadelphia in addition to its large national presence. Capital BlueCross is focused on 21 counties in Central PA and Lehigh Valley.

The strong local orientation of these insurance plans creates a favorable environment for private payer participation in HIEs. The payers will be most interested in supporting HIEs in the region where their members receive care. For most of them, this will be at the community level, rather than the statewide level.

More information on the health plans in Pennsylvania and the size of their membership can be found in Appendix 5.

Most large corporations and organizations are self-insured, and many large entities are in Pennsylvania. Pennsylvania is the corporate headquarters of many national and international corporations; the state is the corporate headquarters for 25 Fortune 500 companies, the fifth highest number of any state in the country. See Appendix 6 for a complete listing of these companies along the 50 largest employers in Philadelphia and the 50 largest in Pittsburgh. Below is a representative, but incomplete, list of large organizations and the number of employees.

1. State of Pennsylvania—150,000 employees
2. Alcoa—59,000 employees
3. UPMC—36,700 employees
4. University of Pennsylvania/University of Pennsylvania Health System—34,868 employees
5. Jefferson Health System/Thomas Jefferson University—32,795 employees
6. Heinz—32,500 employees
7. Merck—12,500 employees
8. Lockheed Martin—11,007 employees

Large companies tend to be self-insured and can also have a large vested interest in HIEs if they are educated in the important role that HIE plays in improving the quality and value of care. However, it can be difficult to engage them when they have a national or international focus. Also, 12 of the largest 50 employers in the Philadelphia area are hospitals and health-care networks as are 10 of the 50 largest employers in the Pittsburgh area. See Appendix 6. Consequently, many of the self-insured employers may already be participating in the HIE as a large health-care provider. This fact suggests that although self-insured employers need to be engaged in the funding of HIEs, they may not be a major source of statewide funding. However, some may have a high vested interest in participating in HIEs at the community or regional levels. Further study needs to be done to determine the profile of the private pay covered lives in the state to identify potential opportunities for payer participation in HIEs in the state. The study should include both fully insured and self-insured payers.
3.2 Level of Electronic Adoption in Health Care

In 2008, the level of electronic adoption among physicians nationally was 13%. Although data about Pennsylvania is inconclusive, it is reasonable to assume that the overall rate of adoption was about the same with greater adoption by employed physicians and those serving urban areas. Since the HITECH Act in 2009, this should change. Physicians must now meet Meaningful Use requirements using a certified EHR to receive incentive payments. The growth of HIEs and the launch of Regional Extension Centers to assist small practices in adopting EHRs should facilitate adoption.

Hospitals are faring much better. The 2009 American Hospital Association (AHA) survey indicated that 80% of hospitals use some form of EHR. Hospitals are also spurred by the HITECH Act, meeting Meaningful Use requirements, and incentive payments for the use of certified EHRs. HIEs can help hospitals exchange data with hospitals outside their system.

By Physicians

National Survey—In 2008 the New England Journal of Medicine published the results of a national survey from 2758 physicians,9 which represented a response rate of 62%, on the physicians’ use of ambulatory electronic health records. This study revealed that 83% of physicians had no electronic health record. Thirteen percent of the physicians interviewed reported that they had a basic EHR system and were classified as “Semi-functional users” and only 4% were “fully functional” users, ones who reported having an extensive, fully functional electronic records system. Analysis revealed that physicians practicing in large groups, in hospitals or medical centers, and those in the western region of the United States were more likely to use electronic health records.

Pennsylvania Study—In May through June 2007, the Pennsylvania Medical Society conducted a survey, "ConnectTheDocs," of both hospitals and physicians in the State to determine their use of telecommunications and health information technology.10 In the physician portion of the survey, of the 30,423 physicians surveyed, 2,769 or 9% responded. The results of this survey support the finding of the national survey previously cited. Highlights from this study include the following:

- 88% of the respondents have Internet access at the locations where they practice.
- 80% report using PCs and laptops in their practice.


10 ConnectTheDocs: Bringing High Speed e-Medicine to the Patient-Doctor Relationship, Pennsylvania Medical Society, 2007, private study.
• 40% use a network (internal and/or external) to send email between physicians.
• 38% use a computer for staff training or continuing education.
• 19.7% of responding physicians use an EMR.
• Of practices without an EMR system, 36% plan to adopt one in 2—5 years.
• 53% had no plans for adopting an EMR/EHR system.
• 19% of respondents did not utilize high-speed broadband data access in their practices.
• 31% of the respondents utilized DSL, which may not be suitable for all high data volume medical IT applications.

By Hospitals

The hospital portion of the "ConnectTheDocs" Survey was directed to 168 hospitals that were identified by the Hospital & Health System Association of Pennsylvania (HAP) during July, August, and September 2007. The purpose of this survey was to learn about each hospital’s Internet connectivity and cost. Response rates for all hospitals and those located in rural regions exceeded 40%. Highlights of this survey include the following:

• 100% of responding hospitals have Internet access.
• 88% have more than one location to which they provide network connectivity.
• 93% connect to other organizations outside of their own hospital or health system.
• 49% reported Internet capacity in excess of 4 MB; 31% have greater than 10 MB; and 17% have greater than 45 MB.
• 74% reported WAN connectivity

In 2009, the American Hospital Association (AHA) conducted its annual survey of HIT Adoption. The survey included responses from 125 respondents from 175 targeted hospitals and providers. The survey examined hospital implementation and planning in the following areas of functionality:

• Electronic Clinical Documentation (for example, patient demographics, notes, lists, and discharge summaries)

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- Computerized Systems for Results Viewing (for example, laboratory, radiology, and diagnostics)
- Computerized Provider Order Entry (CPOE) (for example, testing, medication, consultation, and orders)
- Decision Support System/Analytics (for example, clinical support, and drug dosing/allergy/interactions)
- Bar-coding (for example, lab specimens, pharmaceutical management, and patient identifier)
- Other Systems (for example, telemedicine, Radio Frequency ID [RFID], and physician use of personal digital assistant [PDA])

![Bar chart](chart.png)

**Figure 3: 2009 AHA HIT Survey—PA Electronic Data Exchange**

The survey found that 84% of Pennsylvania’s acute care hospitals use some functionalities of an EHR. The high initial adoption rate in hospitals is helped by the fact that 98 acute care hospitals are part of larger medical systems. However, only 2.4% of hospitals had a comprehensive system implemented with electronic functionalities in all clinical areas. Twelve percent had implemented a basic EHR system with electronic functionalities in at least one clinical unit with clinical notes. Another 20% use a basic system with electronic functionalities in at least one clinical unit without clinical notes, and another 29% were just beginning to implement a basic system without clinical notes. Sixteen percent of Pennsylvania hospitals do not have EHRs and have no plans to procure one.

In the use of electronic clinical data, some functionalities showed high use by hospitals:

- 80% reported having fully implemented patient demographics.
• 54% had electronic medication lists.
• 55% had electronic discharge summaries.
• 50% of the hospitals had result viewing in all areas.
• 80% of the responding hospitals had results viewing for laboratory and radiology reports and image viewing.
• 59% reported that their systems are fully certified by the Certification Commission for Health Information Technology (CCHIT).

High Adoption Hospitals and Meaningful Use

In the 2009 AHA survey, nine high adoption hospitals responded to additional questions about their capability to meet Meaningful Use by the 2014 deadline and their level of data exchange.

When asked which Meaningful Use criteria will be the most challenging to achieve, the top four responses were as follow:

• Exchange clinical information with other providers (4 responses).
• Generate numerator and denominator data for quality reporting directly from the EHR (4 responses).
• Perform medication reconciliation across settings of care (3 responses).
• Give patients access to their data electronically (3 responses).

These are functions that HIEs are well positioned to provide.

When asked the type of data exchange they participate in, the responses were as follows:

• Their hospital system (8 responses)
• Hospitals outside of your system (2 responses)
• Ambulatory providers inside the systems (9)
• Ambulatory providers outside the system (6)

Data exchange with hospitals outside the system had the lowest response suggesting both opportunities and barrier for HIE.

3.3 2008 Sustainability White Paper

Governor Rendell established the Pennsylvania Governor’s Office of Health Care Reform (GOHCR) in 2003 to coordinate state health policy and assist the Governor in developing a plan for health-care reform in Pennsylvania. In January 2007, GOHCR published a comprehensive roadmap to contain costs while improving affordability, access, and quality of health care in Pennsylvania titled “Prescription for Pennsylvania” (Rx for PA).12

that identified health information exchange (HIE) as critical for improving the quality and efficiency of health care.

Subsequently, Governor Rendell signed several executive orders. On May 21, 2007, Governor Rendell issued an executive order to establish the Governor’s Chronic Care Management, Reimbursement, and Cost Reduction Commission. The purpose of the order is to “design the informational, technological and reimbursement infrastructure needed to implement and support widespread dissemination, adaptation and implementation of the components for chronic care in relevant health care sites throughout this Commonwealth, which result in quality outcomes and cost effective treatments for patients with chronic diseases.”

On March 26, 2008, the executive order establishing the governance structure for the Pennsylvania Health Information Exchange (PHIX) was signed by the Governor. (More information on PHIX is located in the subsequent section titled “High-level Summary of the PHIX Strategic Plan.”)

Discussions related to HIE sustainability are not new to the State of Pennsylvania. In 2008, PAeHI published a White Paper for GOHCR titled “Building a Sustainable Model for Health Information Exchange in Pennsylvania.” The paper deservedly recognized Pennsylvania as “a leader and taking a central role in accelerating the adoption of health information technology (HIT) and health information exchange” evidenced by factual findings found in surveys such as the fall 2006 American Hospital Association Health Information Technology Survey and HIT/HIE successes including the Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS). PA-NEDSS establishes a near real-time secure communications link between laboratories, hospitals, medical practices, and the Pennsylvania Department of Health to enable greater efficiency and effectiveness in reporting, investigating, and tracking reportable diseases.

The White Paper however recognized that adoption and widespread use of HIT and HIE had not reached critical mass, and efforts to-date were local and/or regionally initiated and driven. Several examples of local and/or regional HIE adoption were cited:

- The Philadelphia Health Information Exchange (PHIE)—The nation’s first diagnostic imaging exchange encompassing (as of 2008) approximately 4 million patients, 55 hospitals, and 30 competing health systems.

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Financing Research & Framework Development for a HIE

- Keystone Health Information Exchange (KeyHIE)—Established in 2005 with seven organizations to initially provide patient information at the point of care in emergency departments.
- Susquehanna Health System—Centrally located in Pennsylvania, a Picture Archival and Communication System (PACS) improves access to medical images and information to geographically dispersed physicians while enhancing radiologists’ responsiveness and efficiency.
- University of Pittsburgh Medical Center (UPMC)—Via deployment of their electronic health record (EHR), UPMC enables health-care professionals access to real-time patient clinical information.
- Washington Health Information Network (WHIN)—Connects Washington Hospital with (as of 2008) more than 200 primary care and specialist physicians from the surrounding two counties. Features of the WHIN include a data repository and Web portal.

The White Paper recognized that sustainability requires contributions from stakeholders that derive value and benefits from the exchange of patient information and the “ empowerment of a neutral organization with statewide collaborative capability” to bring these stakeholders together to establish common standards for HIE-related value added services. More specifically, “Building a Sustainable Model for Health Information Exchange in Pennsylvania” recommended the following:

1. A mechanism for payers to support HIEs through a per transaction/usage fee model be collaboratively designed with payer organizations and the state.
2. Empowerment of a neutral organization with statewide collaborative capability to bring the diverse array of potential providers and consumers of HIE services to the table to establish common standards for HIE-related value-added services that may include public health, quality and chronic care, comparative effectiveness analysis, biomedical research, and research related to redesign of the delivery system.
3. Research be commissioned to assess the feasibility of public utility or public authority models to help finance HIEs that meet minimum “core” and/or value-added service standards.
4. Realignment of provider payments over time to appropriately reward and encourage the use of HIE data to avoid complications of chronic illness and eliminate unnecessary, ineffective, or redundant care.
5. Establishment of “core” standards related to HIE implementation using the same collaborative mechanism as previously described for value-added services. These other standards should be related to patient identification, privacy, authorization, and interoperability.\(^{15}\)

6. Acceleration of access to pharmacy-related data sources by HIEs to promote accurate medication reconciliation.

7. Development of a mechanism by which a single standard consolidated data set would satisfy all provider-related State data reporting requirements, be submitted to one State agency, and be distributed by that agency as appropriate.

The State’s approach to the aforementioned recommendations and to other policy areas needs to be consistent with the guiding principles found in PAeHI’s “Connecting Pennsylvanians for Better Health.” (For example, patients come first; consumer privacy, security, and confidentiality are paramount; and multi-stakeholder collaboration is essential.)

### 3.4 High Level Summary of PHIX Strategic Plan

Since its establishment in 2003, GOHCR has been pursuing a consensus approach to developing a statewide HIE. The Pennsylvania Health Information Exchange (PHIX) “is the electronic highway that allows authorized users to securely exchange patient information for the improvement of health in Pennsylvania.”\(^ {16} \) With the passing of the Health Information Technology for Economic and Clinical Health Act of 2009 (the HITECH Act) on February 17, 2009, funds became available for states to plan and implement statewide HIEs. Subsequently, GOHCR submitted comprehensive strategic and operational plans to the Office of the National Coordinator (ONC) in the Department of Health and Human Services.

The PHIX Strategic Plan provided an overview of general topic areas and addressed five key domains essential for developing HIE capacity.

**General Topic Areas**

1. Environmental scan of HIE readiness across health-care providers within the State and potentially external to the State, as relevant.

**PHIX Summary**—Health information exchanges and data sharing projects are occurring in Pennsylvania particularly within larger health systems. In 2009, an American Hospital Association survey investigated how hospitals and health systems were utilizing information/data sharing. (Refer to upcoming “Level of Adoption” Section.)

Examples of health information exchange-related activities across Pennsylvania include the following.\(^ {17} \)

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\(^{17}\) Since the publication of the PHIX Report WellSpan and Pinnacle Health System have begun to share data.
Numerous data sharing programs are evident in the Commonwealth of Pennsylvania, as documented in the PHIX Strategic Plan. The Department of Health (DOH) developed the following:

- The Pennsylvania’s National Electronic Disease Surveillance System (PA-NEDSS) to meet PA’s need to supply surveillance data to the Centers for Disease Control (CDC)
- The Pennsylvania Immunization Information System (PA-SIIS) as a secure means for providers to notify DOH of vaccination administration information
- The Real-Time Outbreak and Disease Surveillance System (RODS) that collects chief complaint information from more than 70% of hospitals with emergency departments and over-the-counter pharmaceutical sales data from over 1,100 PA stores
- Health Care Acquired Infections data
- Adult and Child Lead reporting
- Early Hearing Detection and Intervention Program
- Vital Records Birth / Deaths Systems
- Cancer Registry
- Newborn Screening System

2. Commonwealth Medical College—Organized a health information exchange that developed and adopted a vision, goals, objectives, and strategies associated with developing HIE capacity and use among health-care providers in northeastern PA.

**PHIX Summary**—The vision for PHIX is to strengthen Pennsylvania’s health-care system through the timely, secure, and authorized exchange of patient health information among health-care providers. Health information exchange through PHIX will support
patient-centered health care and continuous improvements in access, quality, outcomes, and efficiency of care.

To achieve the vision of PHIX, GOHCR established the following goals.

- Provide authorized users secure access to patient information at the point of care.
- Align the Strategic and Operational Plans with the Medicaid State Health IT Plan.
- Protect personal health information through privacy policies and security best practices.
- Support “meaningful use” objectives of EHRs by providers and hospitals.
- Strengthen the continuity and coordination of care through enhanced data exchange.
- Lower costs by reducing duplication of testing and services.
- Strengthen current and future health initiatives to improve clinical outcomes, improve patient safety, ensure security, and reduce costs by supporting the health information exchange needs of all providers, including those involved in the Medical Assistance Program, Commonwealth Chronic Care Initiative, Public Health, Long-Term Living, and other health-care initiatives.
- Enable affordable and efficient health care.
- Enable engagement and education of consumers.
- Ensure that the costs of PHIX do not add to the cost of health care and that PHIX assists in lowering the cost of health care in Pennsylvania.
- Ensure that the HIE initiative is guided by an integrated governance structure of key community stakeholders.
- Focus on developing an enterprise approach for Pennsylvania that is aligned with the Federal health Information Technology Strategic Plan including the adoption of federally-recognized standards.
- Provide multiple methods for accessing data by patient and providers through PHIX.
- Encourage current and future use of EHRs throughout Pennsylvania.
- Provide the ability to connect to the National Health Information Network.

3. HIT adoption initiatives thus demonstrating a more comprehensive approach for planning across the State.

PHIX Summary—In 2009, 84% of Pennsylvania’s acute care hospitals were using some functionalities of an EHR. The high adoption rate in hospitals is in part because 98 of 165 acute care hospitals are part of larger health systems. As of May 2009, only 2.4% of hospitals had a comprehensive system implemented with electronic functionalities in all clinical areas.
Physician adoption of EMR/EHRs is proceeding more slowly—standing at 19.7% in 2007. Of this percentage, 63% ordered labs or radiology electronically, whereas 84.4% viewed lab results, and 80.8% viewed radiology results electronically.

HIT Adoption Case Studies cited included the Pennsylvania Chronic Care Management, Reimbursement and Cost Reduction Commission, Geisinger Health System, and the University of Pittsburgh Medical Center (UPMC). In May 2007, the Pennsylvania Chronic Care Management, Reimbursement and Cost Reduction Commission was created to develop a strategic plan for treating chronic disease that would improve the quality of care for those with these conditions while reducing avoidable illnesses and their costs. The model being implemented includes a Web-based patient registry to track a number of interventions and clinical parameters important in evidence-based chronic disease management and provides alerts if there are problems.

Geisinger Health Systems has successfully accelerated the widespread use of an EHR with its 670 physicians. UPMC is implementing an interoperable platform that connects virtually all clinical systems into one “shared” record.

4. Interdependencies and integration efforts between PA Medicaid HIT Plan and statewide HIE efforts.

**PHIX Summary**—The Department of Public Welfare’s (DPW’s) Office of Medical Assistance Programs is responsible for creating programs and initiatives to support and validate “meaningful use” among their providers and hospitals. PHIX is viewed as the mechanism to enable achievement of the Medicaid State Health IT Plan (SMHP). The development of PHIX will be coordinated with the SMHP and other medical assistance initiatives that will contribute to and benefit PHIX. Leveraging resources such as Pennsylvania’s Medicaid Management Information System (MMIS), known as PROMIsë™, is crucial.

DPW is developing an interactive statewide Medicaid e-prescribing network. This network will integrate with PROMIsë™ to ensure that prescriptions are medically appropriate and accurate in relation to a Medicaid beneficiary’s eligibility and coverage rules.

5. Coordination activities with Medicare and relevant federally funded State programs.

**PHIX Summary**—GOHCR is reaching out to Medicare and federally funded state programs to make sure that their needs are considered as the statewide HIE is planned and implemented. Some of the programs include Division of Disability Determination in the Department of Labor and Industry, Epidemiology and Laboratory Capacity Cooperative Agreement Program, and Assistance for Integrating the Long-term Care Population into State Grants to Promote Health IT Implementation, and so on.

6. Coordination with other ARRA programs such as the Pennsylvania Regional Extension Centers (PA-REACH East and PA-Reach West), workforce development initiatives, and broadband mapping and access.
**PHIX Summary**—PHIX should be coordinated with the Regional Extension Center, activities to enhance broadband connectivity and workforce development resources made available through ARRA.

Five Domains

1. **Governance**—Addressing stakeholder convening functions of consensus building, trust creation, and HIE oversight and accountability

**PHIX Summary**—The initial startup of PHIX is managed by the Commonwealth in a highly collaborative effort with stakeholders. The existing governance structure has already completed significant work needed to launch PHIX and will be augmented to ensure that PHIX is given the best possible start during 2010.

A public authority will be created through legislation to manage the long-term governance of PHIX. The public authority will be accountable to a board of directors composed of key stakeholders, with day-to-day decisions made by the Executive Director. The Chair of the Authority will be appointed by the Governor.

2. **Finance**—Encompassing the identification and management of financial resources necessary to fund HIE

**PHIX Summary**—HITECH funding for Pennsylvania ($17.1 million) and GOHCR’s current PHIX budget of $1 million will be used for implementation of PHIX beginning in 2010.

The Finance Work Group from the PHIX Advisory Committee is currently working to recommend a business case and long-term financing plan for PHIX. Options for additional revenue for building the infrastructure under consideration include voluntary contributions from insurers, health systems, Medicaid, and others who will benefit. Subscriptions and transaction fees are under consideration to help pay for ongoing cost.

3. **Technical Infrastructure**—Including the architecture, hardware, software, applications, network configurations, and so on to physically enable HIE technical services

**PHIX Summary**—GOHCR will issue a Request for Proposals to select a vendor to build the PHIX infrastructure. The PHIX governing entity will work with the Pennsylvania Regional Extension Center to promote HIT adoption by hospitals and physicians, which is vital to the success of the PHIX technical infrastructure.

4. **Business and Technical Operations**—Including activities that are required to effectively implement and maintain HIE services throughout all geographies and providers across the State

**PHIX Summary**—An incremental approach will be used for implementing PHIX, leveraging the health-care organizations capable of supporting HIE and supporting the needs of state Medicaid providers. A detailed communications plan will be designed to
educate consumers and providers about how electronic records and health information exchange can improve the quality and efficiency of health care for Pennsylvanians.

5. Legal / Policy—Addressing aspects of HIE privacy and security issues, state law harmonization and modification processes, trust agreements and information exchange oversight, and enforcement.

PHIX Summary—PHIX infrastructure will meet the required federal and state standards for data security and integrity and establish appropriate authentication, credentials, and consent management mechanisms to ensure protection of consumer privacy. The approach to patient consent for sharing health information through PHIX will maintain the status quo. Except for super-protected information (HIV / AIDS status, mental health, substance abuse treatment, and so on) consent would be established based on existing laws and policies. Patients signing HIPAA consent forms would have their health information included for HIPAA approved purposes unless they affirmatively opted out.

4.0 Financial Sustainability

4.1 The Basics of Financial Sustainability

To provide a foundation for understanding financial sustainability, this section provides an overview of typical participants in an HIE, the typical core functions of an HIE, the typical technology infrastructure, principles of organizing HIEs for sustainability, and the types of HIEs.

Typical Participants in an HIE

When an HIE reaches a critical mass of participants and expands beyond one provider network, a plethora of participants can engage in data exchange with an HIE irrespective of whether the HIE is organized around a community, a region, or a state. HIEs include the providers along the continuum of care who can join as standalone institutions or as a network. Public health, Medicaid, and other state agencies can connect. More HIEs are including a personal health record as an option for patients without other solutions. Some communities and states have plans to connect to NHIN, the national network. Many other types of entities can and do participate, and increasingly, administrative data is provided by payers.
TYPICAL CORE FUNCTIONS OF AN HIE

Today, most HIEs in Pennsylvania and around the country provide, plan to provide, or are considering the following core services:

1. Secure clinical messaging—The capability to move the data from among users across organizations. This is a core function of an HIE and provides many uses. A primary and high volume use is electronic delivery of lab and radiology results and hospital reports between data senders (hospitals, labs, and radiology centers) and physicians. This service is frequently offered to physicians at no charge. Some HIEs refer to this as secure results delivery, which is one function of clinical messaging.

Clinical messaging is also frequently used for cross-referrals between physicians, transfer of patient information between hospitals and long-term care facilities, transfer of information among clinicians to enhance coordinated care for patient centered medical home programs, and the transmission of reportable conditions to public health.

2. Inquiry—The ability of an authorized clinician to look up clinical and administrative data from multiple sources through the HIE. This service is frequently offered to physicians at no charge. This “snapshot” of patient data is often called a virtual health record or a portal.

Community-wide HIEs tend to share Continuity of Care Data (CCD) information including patient demographics, insurance information, diagnosis and problem list, medications, allergies, recent test or imaging
procedures, and care plan. Emergency department physicians can go to the exchange to pull data on presenting patients from care episodes received across the community. HIEs focused around a single health system tend to share more types of data available to the hospital but from fewer sources across the community.

3. **Web-based EMR**—Some HIEs are providing physicians with simple, Web-based EMRs at no cost or at a low cost to facilitate the movement of physicians from paper to electronic tools and to enable the entire provider community to take full advantage of the HIE. Some small hospitals, clinics, and other small providers also use this function. For practices that currently have an EMR, most HIEs can do direct data feeds into their EMR. Some HIEs charge an interface fee for this service. Some HIEs refer to a similar function with reduced capabilities such as EMR Light or EMR Easy. Frequently, these EMRs are not connected to practice administrative functions.

In light of Meaningful Use requirements, many of these Web-based EMRs have been or are becoming certified. For many physicians this Web-based EMR is a transition tool to a more robust EMR at a later date while not losing the opportunity to take advantage of Meaningful Use incentive payments.

4. **ePrescribing**—The ability of prescribers to electronically refill and prescribe medications, do medical reconciliations, and use decision support tools. Some HIEs have chosen to offer this service to physicians for a small fee. Although not all HIEs offer this function, many do because of federal incentive programs around ePrescribing and the need for this function by small, independent practices and clinics. Most ePrescribing modules include connectivity to SureScripts, which has been funded by prescription benefits organizations, drug store chains, and a pharmacy group.

5. **Public health connectivity**—Many HIEs use the clinical messaging function or direct data feeds to enable electronic submission of reportable conditions to the public health department and to enable the public health department to send alerts. Usually, there is not a charge for this service.

6. **Direct data feeds through the HIE**—Most HIEs provide direct data feeds from data senders to the HIE and then route the data to other users. This is a major source of efficiency gains for the data senders. Routed data can go directly into provider EMRs, public health data bases, registries, and more. There is commonly an initial and ongoing interface charge beyond the fees charged to participating organizations.

With these core tools, there is endless innovative ways to imbed the HIE into current and redesigned workflows. For example, IHIE in Indianapolis now sends the results of new-born screening tests to public health using clinical messaging. Practices are now positioned to implement patient-centric medical home models. Disease registries can
be populated and used by clinicians to improve patient care and outcomes measures. Clinicians can more easily do medication reconciliations.

Some state-level HIEs are choosing not to perform all these functions but to merely move the data from one hospital-based HIE or community-based HIE to another. This requires a minimal technology infrastructure including a master patient index, record locater service, interfaces, and security technology.

Some HIEs are performing other more advanced functions such as Computerized Provider Order Entry (CPOE), personal health records (PHRs), and registries. Other HIEs have chosen to stay out of those areas where there is overlap with EHRs or where another institution is already providing this service.

**Typical HIE Technical Infrastructure**

The focus of this white paper is not to examine how technology and the technical architecture contribute or hinder financial sustainability. However, it is important to have a basic understanding of the technical components of a HIE. According to the State Health Information Exchange Leadership Forum, “There is no one type of technical architecture or way to build it: different requirements will necessitate differing approaches. One of the critical aspects of a technical architecture is consideration of the environment and critical constraints that are relevant and must be taken into account. The technical architecture process “blueprint” will support principles, frameworks and patterns, standards, specific purchase recommendations, and other investment decisions that need to be made regarding technology and its use by stakeholders.”¹⁹

The “blueprint” may be presented differently dependent upon whether the HIE is an integrated delivery network (IDN), a community-level HIE, or a state-level HIE. (Note: HIE types are described in Section 4.2 titled “Simple Framework: Comparing HIEs and Impact on Financial Sustainability.”) Technical architecture options include the following:

1. **Distributed Media Model**—Providers of data store information directly onto patient’s removable media. Strength: Inexpensive. Limitations: Lack of data access, unsynchronized data, and inability for system-wide data analysis. More narrowly focused HIEs such as provider-based personal health records can do well with this model, such as when a patient is given a CD by the physician to update a personal health record.

2. **Peer-to-Peer Model**—Directory server facilitates communications with data displayed within each user’s local system. Strengths: Incremental deployment, standards adopted, less expensive to deploy and replication of data not required. Limitations: More difficult to scale, performance may be

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slow (for example, destination searching), and inability for system wide data analysis. This model is commonly used with a hospital portal providing the hospital’s patient data to physicians at remote locations such as their practice sites.

3. Federated/Record Locator Service Model—Central hub operated by designated authority where master patient index (MPI) is located; actual records are located elsewhere. Strengths: System locates records, scales well, facilitates system wide data analysis, and supports incremental participation. Limitations: Strong central coordination required, harder for individual systems to participate, more time to get data (request query and query to authoritative system), and other systems may be unavailable at query time. Larger HIEs, such as community/regional or state-level HIEs, with many participating stakeholders, usually have a technical infrastructure with more features that enable data exchange across organizations and systems.

4. Centralized Warehouse Model—Central database operated by authority that contains patients and data. Strengths: Less real-time independence on other systems and economies of scale. Limitations: Strong central coordination required, data timeliness, and harder to implement incrementally. This model enables authorized users to have access to all relevant data enabling such things as longitudinal analysis. Although desirable, this model is cost-prohibitive for many community and state-level HIEs.

5. Hybrid Models—Includes partitioned warehouse or data vaults with central hub, contains MPI but queries made to system specific data vaults or through central hub application. Strengths: System locates relevant records, scales well, facilitate system wide analysis, supports incremental participation, and data remains close to source when using hub. Limitations: Vary depending on partitioned vault or hub model. This model is a blending of the Federated/Record Locator Service Model and the Centralized Warehouse Model enabling many entities with different systems to benefit from interoperable data exchange and data warehouses.

**PRINCIPLES OF ORGANIZING HIEs**

The principles for establishing a viable financial model that is sustainable over the long term are simple. The HIE must offer services that provide tangible and intangible benefits that participants are willing to pay for that exceed the cost of participation. In the short term, stakeholder contributions and grants may launch an HIE, but eventually an HIE must provide benefits that are worth the cost of participation.

In the majority of HIEs the primary stakeholders that are key to launch and achieving ongoing financials sustainability of the HIEs are the hospitals, physicians, and health plans. In the previous 10 years, most of the HIEs were funded by hospitals with potential
startup funding from other stakeholders and no or low-cost participation by physicians. Increasingly, health plans are becoming part of the HIE formula as the HIEs become more engaged in the redesign of delivery systems around care coordination and issues of high value to health plans that are central to the HITECH Act and Meaningful Use.

The experience of successful HIEs shows that there are fundamental factors that influence financial sustainability of an HIE:

1. Medical referral regions (MRRs)—Also known as Medical Trading Areas, these are the naturally occurring regions that reflect the referral pattern of the provider community. When clinicians cross refer to each other, they have a vested interest in establishing an HIE because they have common patients and can improve both the efficiency and coordination of care. HIEs that respect natural MRRs can grow faster than those that don’t. In Pennsylvania there are 14 MRR. 20 (see Figure 5)

![Figure 5: Pennsylvania MRRs](http://www.dartmouthatlas.org/)

2. Speed to critical mass—In the world of data exchange, the more people that use the HIE, the more others will use it and the more organizations will pay for it. So speed of adoption and utilization is key to sustainability.

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HealthBridge, an HIE in Greater Cincinnati, Ohio, understands this when it tracks monthly logins. In the following chart prepared by HealthBridge, HealthBridge reached the tipping point in the second quarter of 2004 based on the number of user logins. After that point, the growth of the HIE accelerated.

**Figure 6: Quarterly HealthBridge Logins by User Type**

3. Physician participation—Physicians are the drivers of HIE clinical activity. When they use the HIE, then others use the HIE, and stakeholder benefits grow. When physicians don’t use the HIE, benefits diminish while costs remain.

4. Low fees by many versus high fees by a few—Economies of scale apply to HIEs. The more participants there are in an HIE, the less it costs per participating organization. The downside to low fees by many is that the more stakeholders that are engaged in negotiating the launch of an HIE, the longer the negotiation stage will take.

5. Connecting many disparate entities adds value along with political and financial complexity—HIEs create more value to all organizations with more rather than fewer organizations participating. Yet, establishing a fee mechanism is difficult when there are disparities in benefits received and capability to pay. Should the Critical Access Hospital (CAH) pay as much per
bed as a large health system? Should a health system that that is already highly electronic pay as much per unit as a hospital that is not fully electronic? What are reasonable fees for hospitals compared to payers? What should public health pay given its mission to serve the public good? What is the governance structure that balances needs of the major funders, the many participants, and community interests?

6. Fees based on benefits received—There are endless means for establishing a fee mechanism for HIE participants. All are used and all work if participating organizations understand the benefits received, the fees are less than the perceived benefits, and the fee mechanism is perceived as fair and reasonable within and across stakeholder groups. Examples of fee mechanisms include flat fee, number of hospital beds, admissions, discharges, number of visits, transaction volume, covered lives, claims, seat on the board, and more. Many HIEs make adjustments for participants based on size, capability to pay, special needs, and so on.

4.2 Simple Framework: Comparing HIEs and the Impact on Financial Sustainability

There are three primary types of HIEs that most states are trying to reconcile: integrated delivery networks, community HIEs, and state-level HIEs. In most states, all these exist, and each type is trying to find a sustainability model. Each type of HIE has benefits and weaknesses. The challenge for most states is to find a way for these to coexist to achieve the greatest good for the state and to minimize the collective weaknesses. To do this, each of these types of HIEs must have a sustainability model.

Stakeholders in each state are working through the issues of how to reconcile the three types of HIEs that are prominent, that at times complement each other; at other times are competitors, and all seeking sustainability. These include the following:

1. Integrated Delivery Networks (IDNs)—Data exchanges organized by one institution, usually a hospital or hospital system that connects to employed and ambulatory physicians and other partners such as long-term care, clinics, and labs. Typical functionality includes clinical messaging, inquiry into health system data, Web-EHRs, full EHRs, and more such as Personal Health Records (PHRs). Other participants may include physician networks or a community health clinic network.

Integrated networks are growing rapidly as a result of the HITECH Act. Hospital vendors are well equipped to set up such networks, and an IDN ensures that hospitals and physicians can participate in Meaningful Use incentive opportunities.

2. Community/regional-level HIEs—This usually describes a multi-stakeholder data exchange organized around a common medical referral region. When a
community-level HIE crosses state lines or serves multiple referral regions, it is sometimes called a regional HIE. A community-level HIE usually has a multi-stakeholder governing body. Fees are paid by the stakeholders. Sometimes there are startup grants offered by foundations, states, or federal government agencies, or one of the large stakeholders. Some of these HIEs outsource their HIE infrastructure to other vendors or HIEs while keeping governing, outreach, and training local.

3. State-level HIE—This describes an HIE that is defined by the state geographic boundaries, not by the naturally occurring referral region, although there is some overlap. There were few functioning state-level HIEs in the United States prior to the HITECH Act. Three notable ones are the Utah Health Information Network (UHIN) originally organized around a claims exchange; the Delaware Health Information Network (DHIN); and the Colorado Regional Health Information Network (CORHIO). Since the HITECH Act, all states have been funded by the federal government to plan and implement a state-level HIE with requirements to collaborate with state and federal agencies, including Medicaid and public health, along with other health-care stakeholders in a state. In addition to building a data exchange infrastructure, state-level HIES are responsible for addressing barriers to HIE adoption around privacy and security, standards, and legal issues with bordering states. PHIX has been designated as the state-level HIE in Pennsylvania.

4. Others—There are many other variations of HIEs in operation across the country such as claims-based HIEs offered by health plans; nationally based PHRs (with data fed by providers) such as Google Health and Microsoft Health Vault; and vendor-based HIEs such as Epic that connects Epic systems. There are many more that are emerging continuously. This report does not specifically address this group. It is not yet clear that these other models are impacting the financial sustainability of HIEs in general in Pennsylvania. This may change in the future.

MODELS OF PENNSYLVANIA HIEs

All three of these types of HIEs are represented in Pennsylvania. Following is an incomplete list of HIEs in PA by type of HIE:

1. Integrated Delivery Networks (IDNs)
   - Pinnacle Health System HIE—Connecting hospital, physicians, and other hospital providers and health systems. Pinnacle now has 60,000 transactions a month with more than 400 physicians, 100 practices and clinics, 3 nursing homes, and an imaging facility. It also connects to WellSpan Health for shared patients.
   - Doylestown Hospital—Connecting hospital and physicians.
   - Many more being formed.
2. Blended IDN and Community/Regional HIE
   - KeyHIE—Eleven hospitals connected in northeastern PA.
   - UPMC—Connecting 20 owned academic, community, and specialty hospitals along with several affiliated hospitals. It engages 2,700 employed physicians and 3,600 affiliated physicians.
   - WellSpan Health—Connecting 2 hospitals, 80 owned physician practices, 18 independent practices, 7 retail pharmacies, VNA Home Health, imaging centers, lab annexes, and other health systems (Pinnacle).

3. Community/Regional HIE
   - Six Bridges—Six health systems in Western Pennsylvania that have formed an alliance to create an HIE
   - Harrisburg HIE—Early stages of formation of a multi-health system HIE with a multi-stakeholder Board including hospitals, physicians, other providers, payers, and employers in Central PA
   - Southeast PA—Efforts underway for a regional HIE

4. State-level HIE
   - PHIX

NATURE OF INTEGRATED DELIVERY NETWORKS (IDNs)

The IDNs are growing rapidly and have accelerated as a result of the potential for Meaningful Use incentive payments. IDNs usually consist of a hospital(s) having electronic feeds to ambulatory physicians and other hospital-based providers, provider/patient portals, and health system provider networks. There are also physician-based networks organized around practices that have intentionally selected a common vendor with an HIE application. These networks, if hospital based, are usually funded by the hospitals. Because there is a low-level of cross organization collaboration required, IDNs are fast to start, and quick wins can be obtained. Although there are few organizations financially supporting an IDN, the costs are lower than for other types of HIEs.

The benefits are many. There are improved efficiencies and coordinated care usually with a favorable return on investment (ROI) to justify the investment even without the Meaningful Use incentive dollars. An IDN reinforces key relationships between hospitals, physicians, and other providers and naturally fits with a hospital outreach mission and strategy. Because it is a doable scale, providers can begin redesigning health-care delivery more quickly. If at a later time, the IDN chooses to join a community-level HIE or state-level HIE, it can do so.

Sustainability for IDNs is achievable. They are low cost and provide great benefit to participants. Because IDNs tend to occur within a referral region, they tend to grow organically as physicians using the IDN encourage other physicians and other providers to participate so that more data can be exchanged electronically. Despite the many
benefits of IDNs, it will eventually be hard for IDNs to scale to the bigger wins in quality and value without access to more data sources and resources that are provided by the community and state-level HIEs.

<table>
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<tr>
<th>HIE Comparison</th>
<th>Low Cross-Organizational HIEs</th>
<th>High Cross-Organizational HIEs</th>
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</thead>
<tbody>
<tr>
<td><strong>Examples</strong></td>
<td>Hospital feeds to ambulatory physicians, provider/patient portals, physician networks, health system networks, and such.</td>
<td>Multi-stakeholder community or regional HIEs built around referral regions.</td>
</tr>
<tr>
<td><strong>Speed to Launch</strong></td>
<td>Fast start and quick wins.</td>
<td>Slow to get off the ground.</td>
</tr>
<tr>
<td><strong>Natural Constituency</strong></td>
<td>Local providers.</td>
<td>Local providers.</td>
</tr>
<tr>
<td><strong>Revenue Models</strong></td>
<td>Hospital system frequently pays the bulk of costs.</td>
<td>Usually multi-stakeholder fee system. Fees determined based on benefits received.</td>
</tr>
<tr>
<td><strong>Cost Implications</strong></td>
<td>Few organizations to pay for it; typically lower total costs.</td>
<td>Higher costs but can be lower unit costs.</td>
</tr>
<tr>
<td><strong>Benefits</strong></td>
<td>Provider access to most relevant clinical and admin patient data.</td>
<td>Stakeholder access to broad range of multi-organization patient data.</td>
</tr>
<tr>
<td></td>
<td>Immediate efficiencies and coordination gains.</td>
<td>Quick efficiency and coordination gains.</td>
</tr>
<tr>
<td></td>
<td>Reinforces key relationships.</td>
<td>Greater access to more data because more data sources are available.</td>
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<td></td>
<td>Doable scale, can focus health-care delivery redesign more quickly.</td>
<td>Improved coordination of care because of more data.</td>
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HIE Comparison

<table>
<thead>
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<th></th>
<th>Low Cross-Organizational HIEs</th>
<th>High Cross-Organizational HIEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDNs</td>
<td>Can also join a community or state-level HIE at any time.</td>
<td>Can easily pilot innovation such as Patient Centered Medical Home models.</td>
</tr>
<tr>
<td>Barriers</td>
<td>Hard to scale to bigger wins in quality and value without more data sources.</td>
<td>Moves slowly to get it launched. But once it starts, it picks up speed. Will it miss opportunities?</td>
</tr>
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Table 8: Comparison of Three Types of HIEs

**Nature of Community HIEs**

Community HIEs are usually multi-stakeholder community or regional HIEs built around referral regions serving providers that have a common interest in sharing data because they have common patients. Community HIEs are slower to get off the ground than IDNs because of the complexity of organizing stakeholders who must come to agreement on governance, technology, functionality, costs, revenue structure, legal issues, privacy and security, and more. Typical stakeholders include hospitals, physicians, safety net providers, labs, other providers, and public health. Increasingly, HIEs are asking payers to participate, too.

The revenue model is usually based on a fee structure for stakeholders with fees proportioned to benefits received. Most HIEs negotiate a fee structure for stakeholders that are perceived as reasonable within and across stakeholder groups. Some communities do a ROI analysis for each participant to validate that proposed fees are less than calculated benefits. Although the costs of the community HIE is higher than for an IDN, the unit cost of the community HIE can be lower because of the economies of scale that can be achieved with a community HIE. The growth of IDNs was slower in those communities where there was an established community-level HIE before the growth spurt of the IDNs. This fact suggests that community HIEs do bring value.

Community-level HIEs offer many benefits. Clinicians, patients, researchers, and others have access to patient data from multiple sources, not just a few. This reality brings great benefit when patients use multiple provider organizations. Enlightened physician leaders can quickly understand the value of community-wide HIEs, and with a good outreach program, they can actively participate and encourage participation by other physicians. This growth results in quick efficiency and coordination gains after the HIE is off the ground. The community HIE also positions the providers to effectively participate in care coordination programs offered by health plans, Medicaid, and others. One such example is the Patient Safety Medical Home model. Patient registries and personal health records can be populated with key data. Accountable Care Organizations are also a natural fit. Community HIEs are also well positioned to send and receive data from state, federal, and other key organizations such as public health,
Medicaid, health plans, and academic researchers. Community HIEs are a natural organizing unit for population health planning. They are also well positioned for doing innovative pilots because of the mix of participating stakeholders.

Sustainability for community HIEs is doable with careful planning. There are clear benefits for participants that can be quantified. However, each community has a different mix of factors that influence the revenue capacity of a region to pay for the HIE: Overall population, insurance coverage, patient demographics, large versus small hospitals, independent versus employed physicians, specialty versus primary care, IDNs already in place, institutional leaders, and more. Community HIEs are usually simultaneously negotiating with an HIE vendor to bring the costs within the revenue capacity of the community and negotiating with stakeholders to obtain their final commitment to participate.

Some small communities, although still maintaining control of local multi-stakeholder governance, outreach, and training, are starting to outsource their HIE infrastructure to large HIEs recognizing that their demographics may not support a local HIE infrastructure but can support the costs of participating in a larger, existing HIE.

**NATURE OF STATE-LEVEL HIEs**

If not already developed, state-level HIEs are being developed in all 50 states and U.S. territories as a result of the HITECH Act. The state-level HIEs bring in many stakeholders and political forces. As a result, they launch much more slowly than either IDNs or community HIEs.

There is not a long history of replicable, financially sustainable state-level HIEs in this country because most state-level HIEs are just now getting started, and, in the current economy, states are resource poor. With that said, most states have access to considerable startup funding through the HITECH Act, Medicaid, public health, and other state and federal programs. The primary issue is one of long-term sustainability, not startup. Most states are working toward a revenue model based on benefits received by stakeholder groups. Results vary widely depending on overall population of the states and stakeholder demographics. Pennsylvania’s potential revenue model benefits from a large population and large health-care delivery system that enables the costs to be dispersed more broadly.

The benefits of a state-level HIE are somewhat different than those from either the IDNs or community HIEs and are spread across different stakeholder groups. Assuming that IDNs and community HIEs continue to grow, state HIEs will be providing services to those health-care entities that are not otherwise connected to an IDN or community HIE. In states that have high levels of IDNs and community HIEs, the state HIEs focus on providers not otherwise served by another HIE, Medicaid, state hospitals, and public health clinics, and on connecting the IDNs and the community-level HIEs to the state-level HIE.
State HIEs can also focus on exchanging vital health care information for the purposes of achieving improved health care quality and service delivery on a more national level with stakeholders not as readily identified in the continuum of care. Such stakeholders include the 58 organ procurement organizations (OPOs) located throughout the U.S. and Puerto Rico. The management of the clinical services associated with organ donation and subsequent transplants requires extension coordination and very timely exchange of critical clinical information.

The state is also well positioned to access and distribute state and national data from such sources as Medicaid, public health, national labs, health plans, and more. It is a natural vehicle for state and federal funding. It can serve as a vehicle for HIEs to connect to the National Health Information Network (NHIN), but this is not a requirement of NHIN. An important role that state-level HIEs play is reducing the barriers to data exchange. The barriers that a state HIE is uniquely positioned to tackle include enabling data exchange across state lines, establishing standards and data exchange regulations, and insuring that privacy laws are consistent with federal requirements and with those of neighboring states. The Pennsylvania eHealth Initiative published a white paper titled “Ensuring Privacy and Security of Health Information Exchange in Pennsylvania” (March 31, 2009) that addresses many of these issues.

The complexity of financial sustainability for state-level HIEs is that the state-level HIE serves many stakeholder groups with widely varied benefits. Benefits to state and federal agencies, Medicaid, public health, and state hospitals are clear and substantial. The benefits are less clear for providers, especially those that already participate in IDNs and/or community HIEs where the biggest benefits from efficiency gains and coordinated care of local patients has already been achieved. Several payers in PA serve regional, not statewide, markets so may have the greatest benefits at a regional level. Also, payers, including Medicaid, may also achieve this local-level efficiency and patient coordination gains from membership in community HIEs.

**QUESTIONS TO CONSIDER IN DETERMINING REVENUE MODELS**

Following is a list of questions to consider for sustainability for the IDNs, community-level HIEs, and the state-level HIE.

1. **Assumptions**
   - There are important roles for IDNs, community-level HIEs, and the state-level HIE, and all should be encouraged to grow.
   - IDNs and community-level HIEs will continue to grow because there is a market need for their services.
   - For community and state-level HIEs, fee allocation(s) should be based on benefits received and be perceived as fair and reasonable within and across stakeholder groups.
   - Some services are provided as a “social good” to the broader community.
2. IDNs
   - To what degree should IDNs be encouraged to grow through policies, incentives and/or regulations or allowed to grow naturally?
   - Should IDNs be required to connect to the community-level HIE or state-level HIE so that they do not undercut the financial sustainability models of community-level and state-level HIEs?

3. Community/regional HIEs
   - Should community-level HIEs be encouraged to grow through policies, incentives and/or regulations or allowed to grow naturally (for example, organic growth)?
   - Should incentives or policies be established to encourage the growth of financially sustainable community-level HIEs?

4. State-level HIEs—Non-data exchange activities
   - Who are the true beneficiaries, what are the benefits they are receiving, and what is the value of those benefits?
   - What is the revenue capacity of stakeholders to pay for these services given the development of IDNs and community-level HIEs?

5. State-level HIE—Data exchange activities
   - What is the projected mix of IDNs, community-level HIEs, and the state-level HIE?
   - Who are the true beneficiaries of the state-level HIE and what are the benefits they are receiving and the value of those benefits?
   - What is the revenue capacity of the stakeholders to pay for these services given the growth of IDNs and community-level HIEs?

6. Overall HIE growth strategy
   - What do the answers to the preceding questions say about the overall growth strategy of HIEs in Pennsylvania?
   - What does this say about incentives and policies to ensure financial sustainability of all three levels of HIEs?

7. For services perceived as providing a “social good”
   - What services are perceived as providing a social good?
   - What are the implications for revenue models for each of the three types of HIEs?

4.3 Participating in a HIE: A Business Case

In the bigger picture, the case for HIEs is compelling. Most stakeholders support the vision of HIEs. They recognize that an HIE is an essential component for achieving Meaningful Use through improved outcomes and greater value.
It enables patient centric care—Bringing the right data to the point of care regardless of where the patient has been seen or where the clinician is located. As patients cross provider entities to obtain their care, uncoordinated care has become a growing problem, and uncoordinated care is higher risk and expensive care. Health information exchange is an essential component to increased coordination of care.

Although it is difficult for stakeholders to argue against HIEs in principal, the details of collaboration are difficult to work out, and the final commitment to participate in an HIE is often slow. All organizations need to know the benefits of participation, and some need a formal business case to obtain final commitment. This means that the state level HIE needs to understand the benefits and translate them into a return on investment analysis that can substantiate the financial benefits and justification for participation.

**FOUNDATION FOR BUILDING A REVENUE MODEL FOR HIE SUSTAINABILITY**

In the majority of HIEs, hospitals, physicians, payers, and other stakeholders are the key players in achieving sustainability. There is a business case for participation by each of these four groups.

- Hospitals—Benefit from coordinated care, improved efficiencies, and better outcomes from data exchange. In most cases, hospitals have the resources to pay for an HIE.
- Physicians—Benefit from improved coordination and care and practice efficiencies. Physicians drive referrals and the flow of data. Their participation is needed to achieve a critical mass of data, so physician adoption is key. Because physicians drive referrals, they are a key to hospital participation. Some HIEs charge physicians for participation in the HIEs whereas many do not.
- Payers—Benefit from improved coordination of care and efficiencies in the delivery system. Although many community-level HIEs have evolved without health plan participation, health plans have the financial resources to fund HIEs. Over time, more provider-driven HIEs are engaging health plans in their HIE. This is particularly true of state-level HIEs.
- Other stakeholders—Public health, nursing homes, pharmacies, other providers, state agencies, federal agencies, and others.

The sustainability model for an HIE is developed by identifying the following:

- The revenue capacity of a community or state on a sustainable basis by looking at the demographics of the region among hospitals, physicians, payers, and other stakeholders
- Estimating the capacity within a stakeholder group to pay based on the relative size of the institutions and their commitment to the community or state
• Estimating the capacity across stakeholder groups given their potential interest in the community or state and their relative size
• The expectation of participation by these stakeholders and the benefits received.
• Speed of the roll out
• Reasonable proposed fees aligned for each stakeholder

This potential revenue model is compared against the projected expense budget for profitability. The expense budget is frequently tied to the HIE vendor selection process and the negotiated costs from that process.

Obtaining financial commitment from many stakeholders to financially participate in an HIE is a process, and stakeholders need to perceive it as such. At the individual organization level, the foundation for building the revenue model is to identify the benefits to each of the participating organizations and calculate a return on investment (ROI) analysis. Individuals within a stakeholder organization need to sell financial commitment inside their own organizations, and they need the tools to do so.

In Section 4.4, "Lessons Learned from Other Sustainable HIEs," several of the HIEs describe a process in which the stakeholder groups decide what percent or dollar amount a stakeholder group is responsible for. (for example, “x% of the annual costs are the responsibility of the payers.”) The stakeholder group then decides how they to allocate the costs within the stakeholder group (for example, mechanism for determining fees for each payer).

Appendix 7 identifies benefits for hospitals, physicians, payers, and other key stakeholders.

### 4.4 Lessons Learned from Other Sustainable HIEs

For this study, interviews were conducted with 11 different successful HIEs around the country. They included four state-level HIEs and seven community or regional-level HIEs. Regional-level HIEs were those that functioned like a community-level HIE but were large and usually crossed state lines. Five HIEs launched in 2003 or earlier were selected because they had demonstrated long-term financial sustainability. Most of them did not have grant funding. The others were selected because they were also sustainable or had demonstrated innovative approaches to achieving sustainability relevant to Pennsylvania. Capital Area RHIO, an HIE to launch in 2010, and MiHIN, a state-level HIE that is still in the planning stages with ONC, were selected because they have a deep understanding of the issues around community versus state-level HIEs, an issue also of importance to Pennsylvania.

In each of these cases, the top executives agreed to be interviewed and share their information. Appendix 8 includes Interview Summary Tables for Each Interview. Below are the tables of the organizations interviewed.
### National HIEs Interviewed Started 2004 or Earlier

<table>
<thead>
<tr>
<th>Health Exchange</th>
<th>Service</th>
<th>Type of HIE</th>
<th>State Location</th>
<th>Launch Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franciscan HIE</td>
<td>Clinical Exchange</td>
<td>Regional HIE</td>
<td>Washington</td>
<td>1998</td>
</tr>
<tr>
<td>HealthBridge</td>
<td>Clinical Exchange</td>
<td>Regional HIE</td>
<td>Ohio</td>
<td>1997</td>
</tr>
<tr>
<td>IN Health Information Exchange</td>
<td>Clinical Exchange; Quality Program</td>
<td>Regional HIE</td>
<td>Indiana</td>
<td>2003</td>
</tr>
<tr>
<td>Inland Northwest Health Services (INHS)</td>
<td>Shared IT Services</td>
<td>Regional HIE</td>
<td>Washington</td>
<td>1996</td>
</tr>
<tr>
<td>UHIN</td>
<td>Claims Exchange; Clinical Exchange</td>
<td>State-level HIE</td>
<td>Utah</td>
<td>1993 (claims); 2004/10 (clinical)</td>
</tr>
</tbody>
</table>

Table 9: National HIEs Started 2004 or Earlier

### National HIEs Interviewed Started 2006 - 2008

<table>
<thead>
<tr>
<th>Health Exchange</th>
<th>Service</th>
<th>Type of HIE</th>
<th>State Location</th>
<th>Launch Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MedVirginia</td>
<td>Clinical Exchange</td>
<td>Community HIE</td>
<td>Virginia</td>
<td>2006</td>
</tr>
<tr>
<td>Minnesota HIE</td>
<td>Clinical Exchange</td>
<td>State-level HIE</td>
<td>Minnesota</td>
<td>2008</td>
</tr>
<tr>
<td>Rochester RHIO</td>
<td>Clinical Exchange</td>
<td>Community HIE</td>
<td>New York</td>
<td>2008</td>
</tr>
<tr>
<td>VITL</td>
<td>PCMC pilot; Clinical Exchange; eRX pilot</td>
<td>State-level HIE</td>
<td>Vermont</td>
<td>2008</td>
</tr>
</tbody>
</table>

Table 10: National HIEs Started 2006-2008

### National HIEs Interviewed Planning and Early Stage Start-up

<table>
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<tr>
<th>Health Exchange</th>
<th>Service</th>
<th>Type of HIE</th>
<th>State Location</th>
<th>Launch Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capitol Area RHIO</td>
<td>Clinical Exchange</td>
<td>Community HIE</td>
<td>Michigan</td>
<td>2010</td>
</tr>
<tr>
<td>MiHIN Resource Services</td>
<td>Exchange between Sub-state HIEs</td>
<td>State-level HIE</td>
<td>Michigan</td>
<td>Not Launched</td>
</tr>
</tbody>
</table>

Table 11: National HIEs Planning and Early Stage Start-Up

**INTERVIEW HIGHLIGHTS: LONG-TERM SUSTAINABLE HIEs**

The five long-term sustainable HIEs (all organized in 2003 or earlier) started small and grew incrementally from a small HIE to a large regional or state-level HIE. They started with basic services and expanded them as they went along based on customer demand.

- **Franciscan HIE**—Started as a clinical exchange in 1998, with the vision of one doctor and the participation of one hospital in the rural Olympic Peninsula of Washington. Today, it is a physician-driven HIE in 10 counties with one health system (and a second one joining), 2,000 physicians, 617
organizations including 487 clinics, 20 rural hospitals, a payer, HMO, skilled nursing site, and other providers. Franciscan HIE has developed a sustainability model that is funded by the providers and physicians.

- **HealthBridge**—Started as a clinical exchange in Cincinnati in 1998, with four hospital networks and today is in three states (Ohio, Kentucky, and Indiana). It has more than 30 hospitals (10 health systems, 5,500 physicians, more than 800 physician practices, 17 health departments, large independent commercial labs, diagnostic centers, nursing homes, and more. It is the outsourced HIE for three separate HIEs in Ohio, Indiana, and Kentucky with the potential for further outsourcing. HealthBridge has developed a sustainability model that is funded by the health systems and other providers with financial participation by physicians.

- **Indiana Health Information Exchange**—Started in 2004 with five hospital systems in Central Indiana and today has nearly 70 hospitals (close to 20 health systems) and 19,000 physicians across Indiana and Northern Illinois. Its core services include inquiry capability through its INPC network and clinical messaging. In addition, IHIE’s 2-year-old Quality Health First® Program is the first HIE-based quality and pay-for-performance program in the country. It combines claims and clinical data to supply physicians with reports on quality measures and electronic tools for patient chronic disease management.

- **Inland Northwest Health Services**—Launched in 1996, with five hospitals in Spokane, Washington, that agreed to set up an entity to provide shared IT services for all five hospitals. Today, INHS is providing in integrated information system to 38 hospitals, 450 clinics, and 6,000 physicians in Idaho, Washington, and Oregon. It has widespread use of telemedicine, air ambulance, and other vital health-care services. For those practices not using shared services, it offers access to virtual private network. There is a secure wireless access to patient records via smart phones. It will soon provide a standardized data exchange network for providers not using shared IT services. INHS has successfully engaged health systems, physicians, and other providers in its sustainability model.

- **Utah Health Information Network**—Started a clinical exchange in 1993, which quickly spread to the entire state of Utah because of the strong business case around coordinated claims processing. Today it engages 100% of the hospitals, labs, local health departments, and mental health centers. It engages 95% of the physicians. It started a clinical exchange in 2004, which expanded in 2010. To date, it has 500,000 identities in the Master Patient Index and will push for physician adoption in the near future. UHIN has successfully involved payers and health systems in its financial sustainability model for the claims exchange. Building on its history, it is now successfully engaging hospitals, physicians, and payers in its clinical sustainability model.
Interview Highlights: Recent Successful HIEs

- **MedVirginia**—Organized in 2000 and launched in 2006; now has 12 hospitals and 1 million unique patients in Richmond, Hampton Roads, and Lynchburg. It is currently establishing data exchange with VA, DoD, and SSA. Unlike the other HIEs, it is a limited liability company with a small governing board (majority physicians) and a large advisory board. Original owners were a hospital and physician owned network, and it has ownership ties to a care coordination company. MedVirginia has a sustainability model funded by hospitals and physicians and has recently changed its IT infrastructure to scale for growth. MedVirginia is passionate about understanding and meeting the needs of the physicians recognizing that physician participation brings value to the other stakeholders.

- **Minnesota HIE**—Began in 2008; now the state-level HIE. With startup funding provided by two large health systems, three large payers, and the Minnesota Department of Human Services, it provides clinical data and medication claims data for 4.2 million of the 5 million residents of Minnesota. It is now in the process of implementing the physician community.

- **Rochester RHIO**—Started in 2006 and implemented in 2008, in the 10 county Rochester service area. In August 2010, there were 15 hospitals, more than 1,000 physicians, more than 360 practices, and more than 3,500 users and growing. The RHIO has been uniquely successful at obtaining stakeholder funding from hospitals, physicians, and payers. It used HEAL-NY grants and community stakeholder matching funds to build the core infrastructure and now is obtaining sustainable funding from the core stakeholders.

- **Vermont Information Technology Leaders (VITL)**—Began in 2005 and initiated data exchange in 2008, as an essential component of the state’s Patient Centered Medical Home pilot, a key aspect the state’s Blue Print Initiative. Seven-year startup funding for data exchange was provided by the legislature through a mandated fee on payer claims. Currently, 11 of the 14 hospitals are participating in the PCMH pilot, clinical exchange and/or medication histories. VITL has been named the HIE state-designated entity and the state Regional Extension Center. After the 7-year period, sustainability will come from other income sources.
Interview Highlights: Planning and Early Stage Startup

- **Capital Area RHIO**—Started in 2005; launches in November 2010, in a three-county area around Lansing, Michigan. Stakeholders include three hospitals, a medical school, physicians, a community mental health center, public health, a community college, health alliance, the State of Michigan, and others. It offers clinical messaging, a virtual health record, a Web-based EHR “Light,” integration with independent and institutional EHRs, ePrescribing, and more. Capital Area RHIO has been unique in its capability to identify benefits for all stakeholder groups, not just a few, and to find creative ways to obtain stakeholder funding from many beneficiaries.

- **MiHIN Resource Services**—In 2006, Michigan developed and funded an HIE strategy to organize regional HIEs around Medical Trading Areas. Over time, this triggered the formation of several HIEs in the state organized around regions, IDNs, networks of physicians, and more. MiHIN has had many years of experience reconciling how these HIEs connect to each other. MiHIN Resource Services reflects that consensus between the regions and the state. It serves its primary customers—sub-state HIEs, payers, and the State of Michigan—to exchange data between these customers rather than providing services directly to the user organizations. MiHIN is currently still in the planning stages with ONC. After implementation begins, it will implement seven HIEs over an 18-month period. Capital Area RHIO will be one of the first two HIEs connected to MiHIN.

### Many Governance Similarities

The governance models were predictable. All but one HIE was a not-for-profit or 501(c)(3). In one way or another, all governing bodies were a multi-stakeholder body or were advised by one. MedVirginia is unique because it is a limited liability corporation owned by a hospital physician network. There is a small Board with majority physician leadership and a multi-stakeholder Advisory Board.

### Core HIE Services

With the exception of VITL, MiHIN, and INHS, the HIEs had or were working toward some or all the core HIE services: clinical messaging and inquiry. Most were working with the public health department for reportable conditions reporting or access to the immunization registry. Many had or were planning ePrescribing, orders, and physician workflow tools. Six of the HIEs had or were obtaining low-cost, Web-based certified EHRs for those practices without EHRs to help physicians meet the requirements of the Meaningful Use.
VITL is also moving in this direction with its data exchange, but, unlike the other HIEs, its roots were in transforming practices through the Patient-centered Medical Home Pilot of which data exchange was a tool. Currently, MiHIN has chosen a more limited role of moving data from one sub-state HIE to another with core HIE services provided by the sub-state HIEs. At this point, MiHIN is expecting that sub-state HIEs, rather than MiHIN, will be the direct service providers. INHS is unique because it serves as the shared IT services for 38 hospitals and the majority of physicians. Even so, those providers not using the shared services can still access patient data through the Virtual Private Network and, in the future, through standardized data exchange into a provider EMR.

**Startup Funding**

Startup funding for clinical exchanges has varied widely from $750,000 from the Franciscan Hospital in 1998 for the Franciscan HIE and $1.4 million from the State of Michigan in 2007 to the Capital Area RHIO to $20 million to the Rochester RHIO from HEAL-NY grants and multi-stakeholder community matching funds. The pattern for funding source is tied to who the vested stakeholders are in the community. For many, it was the hospitals such as with HealthBridge that started with four health systems in Cincinnati. IHIE also benefited from grant opportunities through its relationship with Regenstrief Institute. MedVirginia had private investors. VITL was funded by the legislature. MN HIE was funded by leading hospitals, payers, and state government.

**Ongoing Fees**

Hospitals—Of the ten operational HIEs in 2010, nine of the HIEs charge fees to hospitals. Although fee mechanisms vary widely, most operate out of the principle that fees should reflect benefits received. Representative fee mechanism include monthly rate for data feeds plus startup rate; monthly subscription fee; volume-based sliding scale transaction fees for results delivery; fees tied to specific services used; formula-based fee for results delivery; and monthly subscription on a per physicians basis with a cap for large organizations. Several organizations spoke of the need to change the fee mechanism as the mix of services for results delivery versus inquiry changes over time.

UHIN and Rochester RHIO have gone through a negotiation process with stakeholders to determine an appropriate fee structure. To support the new clinical exchange, stakeholders in UHIN have agreed to pay fees in the following formula to cover costs: 33% hospitals, 33% physicians, and 33% payers. Hospitals will be responsible for determining how their share will be allocated. Rochester RHIO stakeholders have determined the following formula for covering costs; 1/3 hospitals and 2/3 payers. The five large urban hospitals will determine how to allocate their share (2/3 of the hospital total) and the 10 rural hospitals will determine their allocation (1/3 of the hospital total).

VITL does not yet charge significant fees to the hospitals but expects to do so in the future. MiHIN Shared Resources will be charging fees to sub-state HIEs, payers, and the State of Michigan. The fee mechanism, which has not yet been determined, will be based on benefits received.
Physicians—Of the ten operational HIEs in 2010, eight charge fees to physicians. There are four types of scenarios for physician fees.

1. No charges to physicians—Only IHIE and VITL do not charge fees to physicians. VITL may change this in the future as more services are added.

2. Charges to physicians for some services but not for others—Most of the HIEs charge for some but not all services. It is common for the HIEs to not charge for basic clinical messaging and the inquiry capability, but to charge for additional services. Franciscan HIE charges for Web-based EHR and ePrescribing. HealthBridge charges for PQRI, eligibility verification, ePrescribing, and the registry, among other services. Rochester RHIO and MedVirginia have obtained a new certified Web-based EHR that is available for a fee. Capital Area RHIO plans to charge for Web-based EHR, ePrescribing, and for EMR hook ups.

3. Charges to physicians for all services—For the clinical exchange UHIN is charging a sliding scale fee for all services whether used or not based on the size of the practice. UHIN charges its one person practice $600/year for all clinical HIE services. MN HIE charges a monthly subscription fee based on the size of the group with the lowest rates set at $60/mo. per provider.

4. Charge for shared IT services—INHS is unique because it offers shared IT support services. This infrastructure service goes significantly beyond the typical exchange services of other HIEs. The average physician using INHS shared IT services pays $350–500 per month for a full-support model, which is lower than a full EMR when not an ASP model through INHS. This compares to the more limited exchanges that charge between $50–$250/mo./doctor for specific services.

Payers—Of the 10 operational HIEs, payers are participating financially in 6 of them. Each circumstance is unique and instructive.

- **UHIN**
  - Administrative Exchange—Since 1993, payers have been paying 70% of the revenue model for the administrative HIE on a per-click basis. This has been a big benefit to the payers since the beginning of the program. Fees have dropped 30% in the last 6 years due to increases in volume.
  - Clinical Exchange—Each sector (hospital, physicians, and payers) are responsible for 33% of the revenue model. For payers, this is charged on a $0.85 per-member per-month basis, capped at 250,000 covered lives.
IHIE
- Quality Health First®—IHIE has developed a unique HIE-based quality and pay for performance program. It combines claims and clinical data from the HIE for quality reporting and pay for performance. Payers were originally charged $0.30 per-member per-month for participation, but this has dropped as IHIE added more payers. Five health plans and close to 1,400 physicians participate.

Rochester RHIO
- Allocated of Costs—Insured and self-insured payers contribute $2 million annually to the Rochester RHIO. In 2011, this will be supplemented by $1 million contribution from hospitals. The payer contribution is assessed as a percent of claims. Currently, the rate is roughly $57 per member per month but changes as participation increases. The payers are paying higher fees to the hospitals for the RHIO and then reporting the claims each month to the hospitals that then pay the RHIO for services. This model was developed by the payers. Medicaid is not yet a participant.

MN HIE
- Sponsorship—The initial 3-year start-up funding was provided equally by three hospital and three health plan sponsors. All six sponsors remain on the board. Health plans do not pay ongoing fees for services.

VITL
- State HIT Fund and Payer Claims—The state legislature has establish a 7-year HIT Fund to support VITL plus other health-care reform activities. The state puts in .199% of payer claims into the fund annually. This is providing approximately $2.1 million per year for VITL from 2008 through 2015. The HIT Coordinator and the HIT Fund will also provide funds available through federal matches.

Capital Area RHIO
- Covered Lives—Medicaid, Michigan Office of State Employees and Michigan Office of State Retirees, and a health system owned health plan have agreed to pay the RHIO $0.25 per-member per-month for covered lives.

MiHIN Resource Services
- Medicaid and State—The State of Michigan played an important role in helping the Capital Area RHIO obtain funding for its RHIO. Medicaid is funding Capital Area RHIO on a pilot basis and could expand statewide because Medicaid patients are in all regions. The Michigan Office of State Employees and Michigan Office of Retirees will probably not fund sub-state HIEs outside of the Capital Area RHIO, where most of their covered lives are located.
Financing Research & Framework Development for a HIE

- Private Payers—MiHIN Resource Services is in dialog with private payers about funding either MiHIN Resource Services or one or more of the sub-state HIEs. In Michigan there are three primary private payers: one in Eastern Michigan, Western Michigan, and Michigan BCBS. Seats have been reserved for them on the MiHIN Board. MiHIN will welcome payer participation anywhere in the chain.

Other Stakeholder Fees

- **Capital Area RHIO**
  - The RHIO assesses an annual community membership fee for Board participants. Public health pays a surveillance and alerts fee. Michigan State University pays a research capacity fee. Some groups pay multiple fees if they fall into more than one fee category. No stakeholder group pays more than 19% of the total fees.

**SUCCESS FORMULAS FOR SUSTAINABILITY**

What was of particular interest in the interviews was that the same formula for sustainability was mentioned over and over again by the majority of the HIEs, and the formula is surprisingly simple:

1. Operate out of a collaborative vision of improved health care.
2. Pay constant attention to the needs of the leadership physicians and give them the services that they want.
3. Save money for the other stakeholders through improved efficiencies.
4. Don’t provide services that aren’t sustainable.

Even though these organizations are from all parts of the country, their approach was similar. Several of the interviewees told personal stories validating the importance of these principles.

**Collaborative Visions**—Many interviewees spoke about how they managed the collective vision among the multi-stakeholders who are part of their governance in one form or another. Several spoke about the balance between collaboration and competition with the partners and stakeholders.

Ted Kremer of Rochester RHIO speaks of the strong leadership from the employers in Rochester that brought all payers to the table along with the providers. Jan Root at UHIN describes a formal community collaborative process UHIN followed to get each of the three major stakeholders—hospitals, physicians and payers—to pay their share of the costs of the clinical exchange. One key was to identity three successful HIEs: one fully funded by the payers, one fully funded by the physicians, and one fully funded by the hospitals. This demonstrated that there was value for all three groups. Valerie Anderson of Capital Area RHIO built a business case for all stakeholders including public health, community college, university researchers, all payer types, and behavioral health. Each stakeholder group pays something, even if a small amount. Board members
pay an annual membership fee. Collectively, the small stakeholders contribute a significant amount to the HIE. As a result, the intent is for no stakeholder group to pay more than 25% of the costs of the HIE.

**Physician Engagement**—Nearly all interviewees spoke about establishing close relations with physician leaders to identify what services the physicians need. The HIEs recognize that physician participation is key to growth; when physician participation grows faster, the HIE will achieve critical mass sooner, which will result in cost savings for the other providers and sustainability for the HIE.

Physicians will recruit new participating physicians, hospitals, and other providers to make their own practices work more effective, and, if physicians are happy with the HIE services, they will pay for them.

Tom Fritz of INHS speaks of the time several years ago that a group of physicians asked to meet with INHS.

Twelve years ago, INHS was able to validate that physicians were not using INHS’ non-integrated products. So, we started shared services in the community with five hospitals. The data center was originally only intended to serve the five hospitals. After a couple of years, doctors asked to meet with INHS, saying “We are impressed with the IT systems of the hospitals. We are in all five hospitals every day. We will tell you our stories.” There were horror stories. They asked INHS to work with them in running their IT system in a way that reduces costs and maintains the same up time as the hospitals. In that context, INHS brought the same services to the physician practices. Over time rural hospitals joined INHS improving continuity of care throughout the region. Today INHS provides IT support to 6,000 physicians.

Mary Kasal speaks of one physician leader who catalyzed the formation of Franciscan HIE, and since then the HIE has been physician-driven, rather than hospital-driven. As it expands to a multi-stakeholder organization, it plans to remain physician-led and physician-centered in everything that it does. The governance model bears this out. Michael Mathews at MedVirginia speaks of how physicians create demand for the HIE, and the HIE can expand where there are opportunities identified by the physicians. “The case is so compelling that no one can stand up to it. Once there is a demonstration of technical capacity, then we know we can do it, and this reduces opposition.” Keith Hepp of HealthBridge describes its organic geographic growth of core services into three states as a result of referrals from existing physicians. In fact, many HIEs speak of business development in terms of physician outreach.

**Save money for the stakeholders and don’t provide services that can’t be sustainable**—Most of the interviewees are clear about the financial model. They pay close attention to the cost savings the HIE is providing its participating organizations. The HIEs do not jump into a new initiative or service that does not have a potential sustainability model for the HIE and cost savings to the participating organizations.
Several HIEs can tell you the exact month that the HIE achieved critical mass, a marker that an HIE can potentially achieve sustainability.

Tom Penno from IHIE indicates that the ROI to the hospitals for participation in results delivery was significantly higher than anticipated, and this service has fueled continual growth to new hospitals in new markets creating further economies of scale. Keith Hepp of HealthBridge showed that the costs of results delivery dropped for participating hospitals from $0.75 to $0.12 per transaction from 2000 to 2007, for a total annual system-wide savings of $16,380,000 in 2007. It too has continued to expand this product to achieve economies of scale. Michael Ubl at MN HIE and the six sponsors recognized that the point-to-point claims processing in the state was inefficient and costly. The group realized that data exchange for clinical care needed to be different and avoid replicating the nearly irreversible mistakes made in the statewide claims processing system. Jan Root at UHIN indicated that the claims exchange was so efficient due to increasing volume that the fee for processing claims dropped 30% in the past 6 years.

**COLLABORATIVE EFFORTS WITH THE HITECH ACT PARTNERS AND OTHERS**

Part of the intent of the HITECH Act is for greater coordination within the health-care system and greater collaboration among stakeholders. Nearly all the interviewees are actively engaged in collaboration around HITECH Act and related programs.

**Areas of collaboration**—UHIN, MN HIE, VITL, and MiHIN have been designated as their respective state-level HIE. Five of the HIEs are direct or indirect participants in Beacon grants, five are participants in NHIN projects, three are engaged with Social Security Administration program pilots, five are involved with the VA and DoD data exchange program, and HealthBridge and VITL have been named the Regional Extension Centers.

**Unclear relations**—Although there is considerable collaboration, there is still confusion. Many of the HIEs do not have a clear picture how their HIE will align with the NHIN. They see that the HIE and REC in a region should be collaborating, but this is not always happening. Several of the regional HIEs have unclear relations with the state-level HIEs, which are for the most part just beginning to organize. In some cases, the HIEs have long-standing relations with Medicaid. In other cases, Medicaid and the HIE are just now beginning to sort out their relations and roles. Few of the HIEs have strong relations with broadband and telehealth partners, but most interviewees recognize the importance of collaboration in this area.

Many of the HIEs expressed that there were unclear relations between the IDNs and regional and state-level HIEs because of potential competition. The State of New York now has a requirement that, for IT expenditures over a certain amount, the IDN must obtain RHIO sign-off on the request and identify what data will be exchanged.

**FUTURE HIE SUSTAINABILITY POSITIONING**

Given the active involvement of the HIEs in the HITECH Act programs, and access to the funding that goes with these programs, these HIEs are well positioned to develop future
services using federal funds initially. Because these HIEs are already much attuned to building viable business models, having access to this type of grant funding is a great opportunity for them.

In addition, these HIEs are already actively positioning themselves in new relationships and providing new services that align them with the push by payers and providers for greater quality and value in care: quality improvement programs, patient engagement, workflow redesign, patient-centered medical home, Meaningful Use incentives, and accountable care organizations, telehealth, linkages to the social services safety net, and so on. Some of these initiatives have the potential to change the sustainability formula.

5.0 Pennsylvania Interview Insights

5.1 HIE Financial Sustainability

Twenty-eight interviews were conducted with a diverse group of Pennsylvania stakeholders: stakeholders representative of government, health plans, Medicaid, hospitals/health systems, health information, exchanges, physicians, professional societies, public health, regional extension centers, telehealth, care coordination leadership, vendors, and consumers. Additionally, two interviews were conducted with national organizations: the Health Information Management and Systems Society (HIMSS) and the Certification Commission for Health Information Technology (CCHIT). The following table summarizes the number of interviews conducted per stakeholder group.

<table>
<thead>
<tr>
<th>PA Stakeholder Group</th>
<th># of Interviews</th>
</tr>
</thead>
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<tr>
<td>Government</td>
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<td>Medicaid</td>
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<tr>
<td>Health Information Exchange</td>
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<tr>
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</tr>
<tr>
<td>Public Health</td>
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</tr>
<tr>
<td>Regional Extension Center</td>
<td>1</td>
</tr>
<tr>
<td>Telehealth</td>
<td>1</td>
</tr>
<tr>
<td>Care Coordination Leadership</td>
<td>1</td>
</tr>
<tr>
<td>Vendor</td>
<td>1</td>
</tr>
<tr>
<td>Consumer</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 12: PA Stakeholders

Consistent with the HIE models found throughout the United States; the Commonwealth of Pennsylvania is represented by the same three predominant models.
Based on the interview process, the following insights relative to the HIE models were formed.

**INTEGRATED DELIVERY NETWORK INSIGHTS**

Several interviews with Pennsylvania stakeholders suggested that the IDNs would continue to grow because they are relatively easy to do, are relatively low cost, and provide high value. They are a natural fit with a hospital strategy, and currently, hospitals and physicians can be reimbursed through the Meaningful Use Incentive Programs for some of their investments. Hospitals will pay for something local. If the health system has a predominantly employed physician model, the system does not care much about extending exchange to other providers outside of the health system. If most of the physicians are independent, promoting exchange across systems becomes a good physician outreach strategy.

Several interviewees suggested that IDNs enable the data exchange essential for Patient Centered Medical Home (PCMC) models and Accountable Care Organizations (ACOs). This assumes that patients receive care primarily within the integrated network. PCMC initiatives and ACOs have shared financial risk between the providers and payers bringing in the payer as potential funders of data exchange directly or through provider fees. Some interviewees expressed concerns that IDNs do not achieve the full potential of coordinated care unless connected to a community or state-level HIE because other local providers are left out of the hospital network.

This type of exchange is specific to direct patient care, providing the rationale for a lot of internal communication to keep patients coming back. There is a positive return for health systems for funding these data exchanges and can be self-sustaining. Patient Centered Medical Home initiatives and Accountable Care Organizations can thrive within this model providing an additional source of funding from payers.

When you talk about local HIEs, you are talking about people with an enlightened self-interest.

**COMMUNITY-LEVEL HIE INSIGHTS**

Most of the Pennsylvania stakeholder interviewees recognized the community HIEs as a natural organizing unit for HIEs because they are organized around medical referral regions. Nearly all stakeholders receive benefits from data exchange at the community level. Interviewees articulated that it is reasonable for stakeholders to pay for an HIE to the degree that benefit is received. With PCMH initiatives and ACOs, there is a common vested interest among providers and payers for the HIE to succeed, and payers can be a potential funding source.
Several interviewees spoke of the importance of establishing multi-stakeholder community HIEs that engage many providers in a community particularly if they do not require a single vendor solution. Community HIEs result in system wide efficiencies, and they enable community-wide coordinated care resulting in improved quality of care.

The consensus among those interviewed was that community-level HIEs can achieve sustainability. In several current models in Pennsylvania, a predominant provider (for example, hospitals and health systems) establishes the technology and pays for it through its margins. In other models being considered, the HIE will use an independent vendor technology solution that connects disparate systems, and costs are shared among multiple providers and potentially payers and others. Health plans have the potential to fund community-level HIEs also because that is where money is saved. The advantage to do so surpasses the cost, which is why we see this model flourishing. In the short term, one interesting model proposed by an interviewee was to pay hospitals, physicians, and other providers for using the HIE on a per-click basis. The intent of such an approach is to encourage rapid adoption to ensure rapid expansion of the HIE to achieve benefits more quickly.

PCMH initiatives and ACOs operating within the community can take on a role similar to their role within an IDN; they can be a funding mechanism for the HIE.

STATE-LEVEL HIE INSIGHTS

There was a near unanimous opinion that it is reasonable for all stakeholders to be a part of the state-level revenue model if there is benefit received. However, the benefit needs to be clearly articulated in light of the known benefits received at the IDN and community HIE levels.

The state-level HIE begins to pull in third-party stakeholders, such as Medicaid and public health (perceived as major beneficiaries) for the exchange of data with state-level entities and across regions serving a utility function. State-level HIEs also can provide direct HIE applications such as clinical messaging, inquiry, ePrescribing, and so on. A state-level HIE meets standards for interoperability and privacy and security.

Many interviewees expressed the value of data exchange between entities. However, several of them questioned the value of a state-level entity providing a robust set of applications seeing this as the domain of IDNs and community HIEs. Some interviewees were clear that the greatest benefit for providers and their payers would come through the IDNs and community-level HIEs rather than the state-level HIE.

Interviewees saw it as important that states build the business case for participation by stakeholders at the state level. There was a consensus that all stakeholders must be at the table when determining the sustainability model.
A suggested deployment strategy that supports local, regional, and state exchange is to “build from the ground up” by connecting 10–12 community HIEs in a nonproprietary way and then link across the state through a common platform. This unified infrastructure (for example, utility function) was seen as the greatest benefit of the state-level HIE (versus being an applications provider).

This is the most difficult model to identify value/benefits and demonstrate financial sustainability. Transparency is a key to success for the state-level HIE.

An emerging opportunity is for the private sector to be a financial driver for the state-level HIE.

For the state-level HIE, benefits included a unified infrastructure (for example, utility function) versus availability of applications. A few interviewees suggested that private companies such as telecom and broadband companies can deploy this unified infrastructure and (as part of their business growth strategy) will accomplish the goal of statewide exchange that much sooner. This would be a function separate from the governance role that a state-level HIE would be responsible for. Another opportunity identified for funding included state agency grants. These opportunities need to be explored further.

**CONSISTENT INSIGHTS ON SUSTAINABILITY**

Regardless of the HIE model considered, the following insights were shared by the PA stakeholders:

1. Sustainability is a major issue and to develop a sustainable business model requires work.
2. Sustainability requires a diverse set of stakeholders to underwrite the costs regardless of the type of revenue generating model(s) deployed (for example, subscription, membership, and transaction fees).
3. Everyone participating must have a vested interest or the HIE will not be used; all constituents must receive benefit and pay based on value/benefit received.
4. Reasonableness of fees is critical; orders of magnitude should be based on degree of benefit recognizing that benefits are different if the HIE is an IDN, community-level HIE, or state-level HIE.
5. The real costs of any HIE must be understood and communicated to determine if the “value equals or exceeds the costs” for each stakeholder participant group.
6. Other provider organizations (for example, specialty hospitals, long-term care, rehabilitation facilities, pharmacies, and home care) have not been engaged fully in exchange and need to be included so that the entire continuum of care receives value.
There were mixed opinions as to which stakeholder groups would receive the most value/benefit and therefore, their respective contributions for participating in health information exchange.

Some specific thoughts on this subject included the following:

- Physicians benefit because exchange will improve the delivery of care. In addition, physicians need HIE for population health care; they need aggregate data to be paid. Significant education and outreach is needed to get the physicians engaged. The physicians’ immediate focus is on meeting Meaningful Use and the corresponding technology initiative of installing and using electronic health records within their practices. Consequently, incentives will assist in advancing physician participation and adoption in HIE, particularly with primary care physicians. Most interviewees believe that physicians will not pay for participation in an HIE, and if they do, physicians’ contributions will not be significant.

- Health plans' greatest benefit will be economic efficiencies associated with improved outcomes at a reasonable cost. At the most basic level, this comes from the reduction in duplicate testing and medication reconciliation across providers. Ultimately, this is a transformation of how care is delivered requiring providers to utilize both EHRs and HIE. Many administrative costs have been taken out of the system for health plans due to already deployed portals such as Navinet. Most health plans are not statewide, so they have a higher vested interest in selected regions of the state.

- Medicaid’s benefits are the same as those for other payers for their Medicaid population. They have a high vested interest in a solution that addresses all regions of the state. Medicaid is forward thinking and is actively engaged in pay-for-performance programs, statewide immunizations, improved quality outcomes, access to more data for comprehensive view of programs, and ensuring that all providers have access to both EMRs and HIE. They want to eliminate duplicate testing, avoid admissions, reduce readmissions, and eliminate duplicate immunizations. Their current focus is to incentivize physicians to achieve Meaningful Use and do quality reporting. They are viewed as one payer “at the table” and not the only payer.

- Public health is a vital consumer and provider of information. An HIE can provide a more efficient mechanism for feeding data to public health for mandatory reportable conditions. It can increase the data fed into the immunization registry and increase the availability and usability of the registry for providers. Some interviewees felt public health is performing a
public good and should not be charged for services. Others thought public health should be charged a reasonable fee because there is benefit received.

**RELATIONSHIP BETWEEN SUSTAINABILITY AND TECHNICAL ARCHITECTURE**

Many of the interviewees recognize that a viable HIE must meet national current and emerging standards for interoperability and for privacy and security to interconnect with participants within an HIE and across HIEs. Some interviewees recognize that the ability to connect multiple providers and multiple vendors using standards is important to sustainability at the community and state levels. Also, HIEs will play a role in quality outcomes measures at the provider, community, and state levels, which have many requirements including longitudinal analysis. This has an impact on architecture. There are also other factors. For example, as cloud computing gains momentum, data can be more quickly and easily extracted. Thus benefits will be realized faster with less cost incurred.

Generally speaking, however, there is a lack of clarity between sustainability and architecture; even so, there is a sense that architecture will play a role in sustainability.

**RELATIONSHIP BETWEEN SUSTAINABILITY AND MEANINGFUL USE / ACCOUNTABLE CARE ORGANIZATIONS**

Several interviewees referenced the role health information exchange plays as a key component of achieving meaningful use and in the operationalization of Accountable Care Organizations (ACOs). HIE services in the support of meaningful use and ACOs can generate revenue and thus contribute to a HIEs overall financial sustainability.

5.2 Other Key Pennsylvania HIT/HIE Initiatives

**GENERAL**

Interviews conducted with Pennsylvania stakeholders (as part of this project) yielded additional information on HIT/HIE activities within the State. Heritage Valley Health System in southwestern Pennsylvania has an “all inclusive information strategy” that consists of a clinical access portal, a wireless technology information infrastructure, and technology in support of customer access and quality (for example, community portal and care card). The technology platform is also shared with Excela Health.

The Pennsylvania Department of Health (DOH) recently received $2 million of funding for a project to track Sickle Cell Anemia for the purpose of developing a national model. The project will begin with a needs assessment.

The Children’s Institute, located in Pittsburgh PA, began receiving patient information via a secure portal from the University of Pittsburgh (The Children’s Institute’s #1 referral source). The information is imported directly into The Children’s Institute’s
electronic health record as a .pdf file. Although not structured data exchange at this time, it has provided a starting point for health information exchange between these two organizations and developed a framework for exchange between The Children’s Institute and other referral sources.

The Lehigh Valley Health System is evaluating systems for the purpose of aggregating and exchanging clinical information for physicians via a portal. A contract is anticipated to be finalized before the end of 2010. The product will initially provide exchange services at a regional level with plans to grow beyond and communicate with the PHIX.

**MEDICAID**

Pennsylvania’s Medicaid agency, the Department of Public Welfare’s Office of Medical Assistance Programs (OMAP), has recognized HIT as a key element in health-care delivery transformation. OMAP has developed a proposed approach to implementing its vision “to improve the quality and coordination of care by connecting providers to patient information at the point of care through the meaningful use of EHRs.”

The approach includes the deployment of a four-state process beginning with planning and design (initiated in FY 2009), followed by construction (FY 2010), utilization (FY 2011), and operations maintenance (FY 2012-FY 2015).

During the Construction Stage, existing and emerging HIEs and partnering opportunities will be identified. HIE opportunities will be expanded during Stage 4, Maintaining Operations. The EHR exchange implemented for the MA Program will ultimately link with PHIX.

OMAP’s HIT DESIGN (Develop EQUIPs, Support Initiatives, Get Numbers) is a used case approach that links an Electronic Quality Improvement Project (EQUIP) to Medical Assistance quality initiatives and results in that project being evaluated using quantifiable measures; the purpose of which is to assist providers in reaching and demonstrating meaningful use while educating consumers on the linkage between EHRs and improved health outcomes.

**TELEHEALTH**

Broadband, telehealth, and telemedicine are essential to improving coordinated health-care delivery across the entire state and will become key components of successful data exchange. Broadband networks across all sectors of the state are necessary to support the growing use of health data exchange, specifically for high-speed exchange and the capability to transport large digital files such as radiology imagery. Although the private sector will provide broadband to the urban areas, rural areas will be left behind without additional resources to enable broadband in these areas. In combination with broadband access, telehealth (delivery of health-related services) and telemedicine

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21 Transforming Health Care Delivery Through the Use of Information Technology: The Role of the Department of Public Welfare, Office of Medical Assistance Programs; November 17, 2009.
(delivery of clinical medicine) will ensure that all patients have access to quality care, even if they are not physically located in close proximity to their providers, through remote services including consults, diagnosis, emergency care, patient monitoring, provider education, patient education, and more.

The importance of broadband and telehealth was reinforced by ARRA when it allocated $7.2 billion to expand access to broadband services in the United States through The Rural Utilities Service (RUS) and the Broadband Initiatives Program (BIP). This is in addition to the broadband and telehealth funding provided by the National Telecommunications and Information Administration (NITA), an agency of the U.S. Dept. of Commerce through its Broadband Technology Opportunities Program (BTOP).

Pennsylvania is already on the forefront of enhancing broadband capabilities in the nation. It is home to the country’s most aggressive broadband deployment commitments. By 2015, the goal is for every city, town, and village to have access to broadband service—even in the most rural areas. Although Pennsylvania communities and providers have received previous grants, three sets of recent grants will accelerate this effort.

Keystone Initiative for Network Based Education and Research ($99.7 million BTOP grant)—The grant award announced in February 2010, for the Pennsylvania Research and Education Network (PennREN) project, is a public/private venture (anchor institutions will include public and private universities, K–12 schools, public libraries, public broadcasting facilities, and medical facilities) for the design, construction, and management of fiber-optic networks statewide that will offer enhanced broadband services to a host of educational, research, health-care and economic development partners seeking to aggregate services for their members and subscribers at affordable cost. The network will be deployed in a manner that 1) ensures additional capacity is available and accessible for use by state government, county and local governments, nonprofits, research partners and 2) establishes linkages for local health-care organizations to world-class research and clinical case institutions to improve medical care across the Commonwealth. PennREN proposes to become the main artery of health-care information across the state, linking The Hospital & Healthcare Services Association of PA, University of Pittsburgh Medical Center, Penn State, Hershey Medical Center, the Pennsylvania eHealth Initiative, and the Mountain Health Care Alliance.

The PennREN network will be a nearly 1,700-mile fiber network (with broadband speeds of 10 Mbps to 10 Gbps) that expects to expand broadband Internet access and directly connect 60 critical community anchor institutions in 39 counties across South and Central Pennsylvania. Overall infrastructure cost of the broadband system Recovery Act funding includes slightly more than $99 million with approximately $29 million in matching funds.

Enhancing Connectivity in Northern Pennsylvania ($28.8 million BTOP grant)—This grant, announced in February 2010, proposes to increase broadband Internet connection speeds for community anchor institutions and underserved areas isolated by difficult, mountainous terrain across the northern half of the state leveraging the existing microwave public safety communications network. It will serve 32 counties in the east-west corridor of Pennsylvania north of Interstate 80, including the cities of Titusville, Dubois, Scranton, and Wilkes-Barre.

Rural Telemedicine Programs and Broadband Programs (RUS)—In February 2010, the Federal Communication’s Rural Health Care Pilot Program announced the funding of 16 broadband telehealth networks for a total of $145 million using broadband technology to bring state-of-the-art medical practices to isolated rural communities. Four of these awards were to Pennsylvania providers:

1. Geisinger Health System ($902,000)—This project will enable 15 health-care providers to connect to existing broadband networks to access and use high-speed Internet bandwidth connections to transfer radiographs and other medical information and to support electronic record systems.
2. Northeast HealthNET (Pennsylvania, New York, $1.99 million)—This broadband network will facilitate real-time information sharing among approximately 38 mostly rural health-care facilities, and thousands of specialists in Pennsylvania and New York state, to provide remote diagnosis, treatment, and monitoring of patients with chronic and acute medical care.
3. Northwestern Pennsylvania Telemedicine Initiative ($352,000)—This project will improve access to a broad range of specialty medical services at five facilities, two of which are prisons. Its goals include using telemedicine to encourage professionals to establish services and remain in rural communities.
4. Pennsylvania Mountains Healthcare Alliance ($4.49 million)—A new broadband network of approximately 12 hospitals in rural western Pennsylvania will provide a variety of telehealth services specialty care and telepharmacy in 18 counties. The project previously merged with the Juniata Valley Network project, a network in the rural region of the Appalachian Mountains that will connect approximately 79 health-care facilities to enable telemedicine and school wellness programs.
5.3 Quality Initiatives with HIT/HIE Implications

A number of quality initiatives were cited by Pennsylvania stakeholders during the interview process. This section references is a small representation of the activities embraced by Pennsylvania health-care organizations.

Health systems have referenced their own respective quality and outcomes improvement and/or cost reduction initiatives. Implementation of Six Sigma and Lean processes is evident; enterprise-wide clinical decision support committees are active. One specific Lean process, Systems in Partners for Performance Improvement (SPPI), a process used by the Lehigh Valley Health System, was noted.

The Chronic Care Commission’s strategic plan included development of a Chronic Care model in primary care practices across the Commonwealth. The initiative is being implemented in stages throughout PA regions. Pennsylvania stakeholders include health plans, health systems, and physicians.

Another successful model of chronic care coordination is the community-based nurse care-management program developed by Health Quality Partners (HQP), located in Doylestown, PA. This is the only program, out of 15 tested nationally in the Medicare Coordinated Care Demonstration (MCCD), which CMS is continuing to fund and further evaluate. HQP’s CEO, Ken Coburn, is a Board member of PAeHI and strongly affirms the significant contribution HIEs could make to more efficient and effective care coordination.

As referenced in Section 5.2, Pennsylvania’s Medicaid agency, the Department of Public Welfare’s Office of Medical Assistance Programs (OMAP), has recognized HIT as a key element in health-care delivery transformation. The purpose of OMAP’s EQUIPs is to create operational and clinical approaches to the use of HIT by developing and implementing EQUIPs that link MA populations and eligible providers to coded health information contained within an EHR. OMAP EQUIPs are focused on the broad areas of screening, pediatrics, obstetrical care, chronic care, behavioral health, and transition of care. Clinical information collected in an EQUIP and exchanged through an EHR will be linked to quality initiatives.

OMAP’s HIT DESIGN will include a process to evaluate the clinical information exchanged between providers and the Department and how that information is used by providers to improve quality and the coordination of care provided to MA consumers.

In May, Geisinger Health System received $16M to create the Keystone Beacon Community as part of HHS’ Beacon Community cooperative program. The funding will enable Geisinger to extend the benefits of its patient-focused HIT initiatives to five rural Central Pennsylvania counties and deliver improvements in patient outcomes within a 3-year period.
6.0 Opportunities

Efforts of organizations to monitor the progress of HIE have substantiated that advances have occurred. During 2009, the Health Information Technology for Economic and Clinical Health Act (HITECH) provided needed funding to move HIE to a new level in the United States.

**KEY OPPORTUNITY FROM NATIONAL DATA**—According to the 2010 eHI Annual Survey, 73 HIEs are transmitting data used by stakeholders or “operational.” Of those 73, 18 are not dependent on federal funding and are breaking even through operational revenue alone, implying that given the right financial model, HIEs can achieve sustainability.

Several fundamental factors contribute to financially sustaining HIE.

1. Delivery of care around Medical referral regions (MRRs)
2. Speed to critical mass
3. Physician participation
4. Economies of scale supported through a “low fees incurred by many” model
5. Ability to connect to disparate entities
6. Fees based on benefits received

These fundamental elements of sustainability have played a role in the three most prominent types of HIEs that have evolved: state-level HIEs, Integrated Delivery Networks (IDNs), and community HIEs.

<table>
<thead>
<tr>
<th>TYPE OF HIE</th>
<th>IDNs</th>
<th>Community HIEs</th>
<th>State-Level HIEs</th>
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<td><strong>SUSTAINABILITY FACTORS</strong></td>
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<td>Speed to critical mass</td>
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<td>Physician participation</td>
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<tr>
<td>Ability to connect to disparate entities</td>
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<tr>
<td>Fees based on benefits received</td>
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</tbody>
</table>

**Table 13: Types of HIE**

The financial sustainability implications for each type of HIE vary. Sustainability for IDNs is achievable due to low costs, their natural constituencies, and high participant value and benefits. Community HIEs also have a natural constituency and clear benefits. Community HIEs
can achieve sustainability but requires diligent planning. Planning must include a determination of the region’s capacity to pay based on specific community factors such as population, insurance coverage, patient demographics, size of hospitals and/or IDNs within the community, physician market (independent versus employed physicians, specialty versus primary care), institutional leaders, and so on. State-level HIE financial sustainability will require development of a more complex model given the number of stakeholders and their respective perceived values and benefits to be received from participating in the electronic exchange of health information.

**KEY OPPORTUNITY BASED ON HIE TYPE:** One financial sustainability implication is clear across all HIE types and their respective stakeholders. Benefits must be clearly articulated for each stakeholder group, and the perceived value from HIE must be greater to or equal to their financial contribution.

Another contributing factor to the sustainability of HIEs is the conduciveness of the demographics to support exchange functions and the level health information technology adoption that is evident.

**KEY DEMOGRAPHIC OPPORTUNITIES:** Demographic factors that are favorable for a state to support HIE are large, young, and prosperous populations, many medium- to large-size hospitals, several locally oriented payers with a high mix of fully insured lives and a few large self-insured employers, high percentage of large and/or employed physician practices, and a low uninsured population. Less favorable demographic factors for a state supporting HIE are older population, many small hospitals, more smaller and non-employed physician practices, predominance of national health plans, and a high level of self-insured employers. Geographies with a high percentage of rural areas typically are more challenged with initiating HIEs.

The higher the level of HIT adoption among stakeholders, reflective in technology usage, quality initiatives, and so on, the faster HIE activities will be embraced.

HIEs interviewed as part of this study have provided additional insight and common patterns of financial sustainability.
KEY OPPORTUNITIES FROM NATIONAL HIE INTERVIEWS:

Financially sustainable HIEs operate out of a collaborative vision of improved health-care balancing collaboration and competition among partners and stakeholders.

1) Most financially sustainable HIEs consider physician participation as the key to growth, pay constant attention to the needs of the physicians, and give them the services that they want; and as result, physicians will recruit other physicians and hospitals and will pay to participate.

2) Financially sustainable HIEs drive toward improved efficiencies that result in savings for stakeholders such as hospitals, health systems, health plans, Medicaid, public health, and such.

3) Financially sustainable HIEs explore new initiatives diligently and validate that the service is sustainable and will provide cost savings to the participants before engaging in a new service.

4) National interviews confirm that all three key stakeholder groups—hospitals, physicians, and payers—benefit from and do participate financially in sustainable HIEs.

Pennsylvania stakeholder interviews resulted in the following implications.

KEY OPPORTUNITIES FROM PENNSYLVANIA HIE INTERVIEWS:

1) Interviewees recognize that there are multiple types of operational and emerging HIEs across the state, and all need to be supported.

2) Interviewees overwhelmingly support the concept of building sustainable business models around stakeholder benefits. Stakeholders who benefit should pay for the HIE. No one stakeholder group should be responsible for funding an HIE.

3) Several interviewees believe that there needs to be more thought put into how these multiple HIEs coexist and be sustainable.

What does this mean for the Commonwealth of Pennsylvania?

Regarding demographics and the level of adoption, PA has many characteristics that can support the exchange of health information: large population, a significant number of large hospitals (many of which are highly automated), PA focused health plans, as many as 50% of physicians employed by large health systems, and a Medicaid patient population evident in all communities. However, demographics and adoption data that work against HIE sustainability within the Commonwealth include a high percentage of hospitals with less than 100 beds (and may not be as automated), numerous self-insured companies (many of which are health systems) that will be more difficult to mobilize, and a significant number of physicians in small practices and/or in rural areas.
Additionally, the HIEs that have been evolving within the state represent a mix of IDN and community and state-level initiatives. Although health plans are PA-focused, most of them have a community or regional focus rather than a statewide focus. This is also true of most providers. Those health plans and providers with a more narrow focus may receive more benefit at the IDN and community level than the state level.

**KEY OPPORTUNITIES FOR PA:**

1) There is a need for a statewide strategy around all three HIE types. The strategy must address the degree to which growth is encouraged for IDNs; community HIEs and the PHIX; the sustainability models for each; and the next steps that must be pursued to make this a reality.

2) Overall, demographics and levels of adoption support the capacity to fund HIEs; however, financial sustainability strategies must be developed to address the inclusion of rural areas, small hospitals and physician practices, specialty hospitals, and other providers that may not have the resources, or be conveniently located, to engage in existing and/or newly forming HIEs.

3) Pennsylvania stakeholders will pay for the HIEs (based on PA interviews).

4) Pennsylvania stakeholders will fund the HIE model where value and benefits are the greatest and value and benefits received must be equal to or greater than their financial contribution. Other models will be funded if the same criteria are met. (For example, value and benefits received is equal to or greater than their financial contribution.)

5) The role HIE will play in the achievement of Meaningful Use and in operationalization of ACOs is key and must be further explored.

### 7.0 Go Forward Strategy

There is a compelling case to be made that IDNs, community HIEs, and state-level HIEs each play unique roles in the state with complementary benefits. Interviewees have made it clear that all stakeholder groups are more than willing to contribute to the funding of the HIEs in the state to the degree there is benefit received. It is not only desirable, but also imperative if Pennsylvania is to remain a leader in health care. Yet, stakeholder benefits will be unique to each stakeholder group; some will be state-level focused, others will be community-focused, and others will be IDN-focused. Successful HIEs across the country validate that these HIEs can be sustainable and offer various funding mechanisms and consensus processes to ensure success.

With that in mind, PAeHI is proposing that a financial sustainability HIE model be developed to support all three levels of HIEs. There should be an open and transparent multi-stakeholder process to develop the model. It should engage all stakeholder groups to ensure cross-stakeholder buy-in.

PAeHI, which already engages many of the stakeholder organizations, would be more than willing to serve as convener of the process. Given the fast pace of the HITECH Act deadlines and
current HIE activities in the state, this process should be completed within the next 6 months.
Key steps include the following:

1. **Articulate a high-level model that shows how IDNs, community-level HIEs, and a state-level HIE can flourish across the state.** Consider the unique issues in each medical referral region and statewide:
   - Who and geographic reach
   - Expected governance
   - Key functionality and technology
   - Expectations for meeting Meaningful Use and other federal requirements
   - Role relations among the HIEs
   - Benefits and beneficiaries
   - Revenue potential from benefits

2. **Collect market research in areas that need more exploration by medical referral region and statewide:**
   - Physician practice profiles and physician adoption
   - Health system services, locations, and geographic reach
   - Demographics of private pay insurers (fully insured self-pay insurers) and Medicaid
   - Profiles of the current and planned HIEs in the state at all three levels and proposed benefits received

3. **Engage stakeholders in a discussion about the model:**
   - Where is there a match between benefits received and potential funders?
   - Where are there gaps and overlaps in potential services?
   - What regions are potentially sustainable? Not sustainable?
   - What are the Meaningful Use, ONC, and other deadlines that drive decisions?
   - What are the issues and opportunities, such as the use of HIE to increase the success of Accountable Care Organizations?
   - What does this say we need to be doing differently?

4. **Come to general consensus on a revised HIE Sustainability Model and next steps**

5. **Outcomes:**
   - There is a clearly articulated HIE Sustainability Model that shows how the three types of HIEs work together as part of a larger HIE strategy.
   - There is consensus on the potential for financial sustainability for the HIEs in the system and/or an understanding of where there is a lack of consensus.
   - There is a general understanding by all stakeholders of where the benefits accrue to each stakeholder group.
   - Issues and opportunities have been identified for further assessment.
   - Stakeholders are prepared to continue in a process and next steps have been identified.
### 8.1 Appendix 1—Pennsylvania Interview Participants

<table>
<thead>
<tr>
<th>Sector</th>
<th>Pennsylvania Interview Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Care Coordination</strong></td>
<td>James Walker, MD&lt;br&gt;CMIO&lt;br&gt;Geisinger Health System</td>
</tr>
<tr>
<td><strong>Consumers</strong></td>
<td>Ellen Marshall&lt;br&gt;Deputy Director&lt;br&gt;Camden Area Health Education Center</td>
</tr>
<tr>
<td><strong>Government</strong></td>
<td>Peter Adams*&lt;br&gt;Deputy Commissioner&lt;br&gt;Pennsylvania Insurance Department&lt;br&gt;Senator Mike Folmer&lt;br&gt;Senate Majority Chair, Communication &amp; Technology Committee&lt;br&gt;Pennsylvania Senate</td>
</tr>
<tr>
<td><strong>Health Plans</strong></td>
<td>Mike Fiaschetti&lt;br&gt;Senior VP Central Region&lt;br&gt;Highmark</td>
</tr>
<tr>
<td><strong>Health Systems</strong></td>
<td>Richard Snyder, MD&lt;br&gt;CMO&lt;br&gt;Independence Blue Cross&lt;br&gt;Kent Whiting&lt;br&gt;VP of IT&lt;br&gt;Capital BlueCross</td>
</tr>
<tr>
<td></td>
<td>Ron Cowan*&lt;br&gt;CIO&lt;br&gt;Lewistown Hospital</td>
</tr>
<tr>
<td></td>
<td>Sharon Dorogy&lt;br&gt;Director of IS&lt;br&gt;The Children’s Institute</td>
</tr>
<tr>
<td></td>
<td>Don Levick MD&lt;br&gt;Medical Director, Clinical Informatics/Information Services&lt;br&gt;Lehigh Valley Hospital</td>
</tr>
<tr>
<td></td>
<td>Richard J. Schaeffer*&lt;br&gt;CIO</td>
</tr>
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### Pennsylvania Interview Participants

<table>
<thead>
<tr>
<th>Sector</th>
<th>Interviewee</th>
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<tbody>
<tr>
<td>Health Information Exchange</td>
<td>St. Clair Hospital</td>
</tr>
<tr>
<td></td>
<td>Denise Abraham, RN</td>
</tr>
<tr>
<td></td>
<td>Director of Medical Management</td>
</tr>
<tr>
<td></td>
<td>Washington Physician Hospital Organization</td>
</tr>
<tr>
<td></td>
<td>Joel Arker</td>
</tr>
<tr>
<td></td>
<td>Director of Strategic Technical Services</td>
</tr>
<tr>
<td></td>
<td>Pinnacle Health System</td>
</tr>
<tr>
<td></td>
<td>Lisa Khorey</td>
</tr>
<tr>
<td></td>
<td>CIO and Director of Interoperability</td>
</tr>
<tr>
<td></td>
<td>UPMC</td>
</tr>
<tr>
<td>Medicaid</td>
<td>Kelly Lewis, JD, MBA</td>
</tr>
<tr>
<td></td>
<td>President and CEO</td>
</tr>
<tr>
<td></td>
<td>TECHQuest PA</td>
</tr>
<tr>
<td>Nursing Home</td>
<td>Frank Smith</td>
</tr>
<tr>
<td></td>
<td>Manager, Physician Integration</td>
</tr>
<tr>
<td></td>
<td>WellSpan Health System</td>
</tr>
<tr>
<td></td>
<td>Jim Younkin</td>
</tr>
<tr>
<td></td>
<td>Project Director</td>
</tr>
<tr>
<td></td>
<td>KeyHIE</td>
</tr>
<tr>
<td>Medicaid</td>
<td>Izzanne Leonard-Haak</td>
</tr>
<tr>
<td></td>
<td>Acting Deputy Secretary of Medicaid</td>
</tr>
<tr>
<td></td>
<td>Office of Medical Assistance Program</td>
</tr>
<tr>
<td></td>
<td>Dept. of Public Welfare</td>
</tr>
<tr>
<td>Nursing Home</td>
<td>George Hagar*</td>
</tr>
<tr>
<td></td>
<td>CEO</td>
</tr>
<tr>
<td></td>
<td>Genesis HealthCare Headquarters</td>
</tr>
<tr>
<td>Other</td>
<td>Karen Bell, MD, MMS</td>
</tr>
<tr>
<td></td>
<td>Chair</td>
</tr>
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<td></td>
<td>CCHIT</td>
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<tr>
<td>Physicians</td>
<td>Mark Jacobs</td>
</tr>
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<td></td>
<td>Director of IT</td>
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<td></td>
<td>WellSpan Health System</td>
</tr>
<tr>
<td></td>
<td>Chris Kowalsky</td>
</tr>
<tr>
<td></td>
<td>Director, Information Technology</td>
</tr>
<tr>
<td></td>
<td>Center for Organ Recovery and Education</td>
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<tr>
<td></td>
<td>Joseph Cincotta, MD</td>
</tr>
<tr>
<td></td>
<td>Heritage Medical Group</td>
</tr>
<tr>
<td></td>
<td>Jean Stretton, MD</td>
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<tr>
<td></td>
<td>President</td>
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Copyright PAeHI 2010-11
<table>
<thead>
<tr>
<th>Sector</th>
<th>Interview Participant</th>
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<tbody>
<tr>
<td><strong>Professional Society</strong></td>
<td>Gateway Medical Associates</td>
</tr>
<tr>
<td></td>
<td>Martin Ciccocioppo</td>
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<tr>
<td></td>
<td>VP Research</td>
</tr>
<tr>
<td></td>
<td>Hospital &amp; Healthsystem Association of Pennsylvania</td>
</tr>
<tr>
<td></td>
<td>Darlene Kauffman</td>
</tr>
<tr>
<td></td>
<td>Associate Director, Payer Relations</td>
</tr>
<tr>
<td></td>
<td>Pennsylvania Medical Society</td>
</tr>
<tr>
<td></td>
<td>JoAnn Klinedinst</td>
</tr>
<tr>
<td></td>
<td>VP of Professional Development</td>
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<td></td>
<td>HIMSS</td>
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<td></td>
<td>Bernie Lynch</td>
</tr>
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<td>Senior Director of Payer Relations</td>
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</tr>
<tr>
<td><strong>Public Health</strong></td>
<td>Robert Torres</td>
</tr>
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<td></td>
<td>Deputy Secretary of Administration</td>
</tr>
<tr>
<td></td>
<td>Pennsylvania Department of Health</td>
</tr>
<tr>
<td><strong>Regional Extension Center</strong></td>
<td>Dan Jones</td>
</tr>
<tr>
<td></td>
<td>COO</td>
</tr>
<tr>
<td></td>
<td>Quality Insights of Pennsylvania</td>
</tr>
<tr>
<td><strong>Telehealth</strong></td>
<td>Greg Palmer</td>
</tr>
<tr>
<td></td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>MAGPI</td>
</tr>
<tr>
<td><strong>Vendor</strong></td>
<td>Elliot Menschik, MD, PhD</td>
</tr>
<tr>
<td></td>
<td>General Manager, Provider Markets</td>
</tr>
<tr>
<td></td>
<td>MEDecision</td>
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* Invited to participate and not interviewed
## 8.2 Appendix 2—National HIE Interview Participants

<table>
<thead>
<tr>
<th>Name</th>
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<th>Organization</th>
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<tbody>
<tr>
<td>David Cochran, MD</td>
<td>President and CEO</td>
<td>Vermont Information Technology Leaders, Inc.</td>
</tr>
<tr>
<td>Tom Fritz</td>
<td>CEO</td>
<td>Inland Northwest Health Services</td>
</tr>
<tr>
<td>Valerie Glesnes-Anderson</td>
<td>Acting Executive Director</td>
<td>Capital Area RHIO</td>
</tr>
<tr>
<td>Keith Hepp</td>
<td>VP Business Development</td>
<td>HealthBridge</td>
</tr>
<tr>
<td>Mary Kasal</td>
<td>Executive Director</td>
<td>Franciscan HIE</td>
</tr>
<tr>
<td>Ted Kremer</td>
<td>Executive Director</td>
<td>Rochester RHIO</td>
</tr>
<tr>
<td>Michael Matthews</td>
<td>CEO</td>
<td>MedVirginia</td>
</tr>
<tr>
<td>Beth Nagel</td>
<td>HIT Coordinator</td>
<td>MiHIN</td>
</tr>
<tr>
<td>Tom Penno</td>
<td>COO</td>
<td>Indiana Health Information Exchange</td>
</tr>
<tr>
<td>Gina Perez</td>
<td>Declined</td>
<td>Delaware Health Information Network</td>
</tr>
<tr>
<td>Jan Root</td>
<td>President</td>
<td>Utah Health Information Exchange</td>
</tr>
<tr>
<td>Michael Ubl</td>
<td>Executive Director</td>
<td>Minnesota Health Information Exchange</td>
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### 8.3 Appendix 3—Operational HIE Functionalities

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<tr>
<th>Current Functionalities for All HIE Initiatives</th>
<th>2009</th>
<th>2010</th>
<th>Percentage Change</th>
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<tbody>
<tr>
<td><strong>Stage 1 Meaningful Use Core Items</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Connectivity to electronic health records</td>
<td>38</td>
<td>67</td>
<td>76.3%</td>
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<tr>
<td>Health summaries for continuity of care</td>
<td>N/A</td>
<td>49</td>
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<tr>
<td>Electronic prescribing</td>
<td>26</td>
<td>37</td>
<td>42.3%</td>
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<tr>
<td>Alerts to providers-drug-to-drug</td>
<td>N/A</td>
<td>35</td>
<td>N/A</td>
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<td>Alerts to providers-drug-to-allergy</td>
<td>N/A</td>
<td>31</td>
<td>N/A</td>
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<tr>
<td>Clinical decision support</td>
<td>19</td>
<td>26</td>
<td>36.8%</td>
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<td><strong>Stage 1 Meaningful Use Menu Items</strong></td>
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<tr>
<td>Results delivery (e.g. laboratory or diagnostic study results)</td>
<td>44</td>
<td>50</td>
<td>13.6%</td>
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<tr>
<td>Disease or chronic care management</td>
<td>19</td>
<td>27</td>
<td>42.1%</td>
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<tr>
<td>Quality improvement reporting for clinicians</td>
<td>10</td>
<td>21</td>
<td>110.0%</td>
</tr>
<tr>
<td>Reminders</td>
<td>16</td>
<td>24</td>
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<tr>
<td>Immunization registry</td>
<td>N/A</td>
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<tr>
<td>Medication reconciliation</td>
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<td>Patient-provider clinical data exchange</td>
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<td>11</td>
<td>83.3%</td>
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<tr>
<td>Public health: electronic laboratory reporting</td>
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<td>11</td>
<td>83.3%</td>
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<tr>
<td>Public health: syndromic surveillance reporting</td>
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<td>8</td>
<td>-38.5%</td>
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<table>
<thead>
<tr>
<th>Current Functionalities for All HIE Initiatives</th>
<th>2009</th>
<th>2010</th>
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<tbody>
<tr>
<td><strong>Non-meaningful Use Items</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Clinical documentation</td>
<td>34</td>
<td>40</td>
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<tr>
<td>Alerts to providers</td>
<td>31</td>
<td>39</td>
<td>25.8%</td>
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<tr>
<td>Consultation/referral</td>
<td>20</td>
<td>38</td>
<td>90.0%</td>
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<td>Electronic referral processing</td>
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<td>Alerts to providers-drug-to-food allergy</td>
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<td>Claims or eligibility checking</td>
<td>N/A</td>
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<tr>
<td>Ambulatory order entry</td>
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### Current Functionalities for All HIE Initiatives

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<tr>
<th>Non-meaningful Use Items</th>
<th>16</th>
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<td>Disease registries</td>
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<td>Patient access to information through the exchange</td>
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<td>Public health alerts</td>
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<tr>
<td>Episodic grouping of patient data</td>
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<td>Quality performance reporting for purchasers or payers</td>
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<td>Patient-provider communication—other</td>
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<td>Patient-provider email</td>
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<td>Public health: case management</td>
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<tr>
<td>Medical Device Interoperability</td>
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<td>Home Monitoring</td>
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### 8.4 Appendix 4—Independent Laboratories

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<tr>
<th>#</th>
<th>Name of Certified Laboratory</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ASSOCIATED CLINICAL LABORATORIES</td>
<td>1526 PEACH STREET ERIE, PA 16501</td>
</tr>
<tr>
<td>2</td>
<td>ATLANTIC DIAGNOSTIC LABORATORIES LLC</td>
<td>3520 PROGRESS DRIVE UNIT C BENSELAM, PA 19020</td>
</tr>
<tr>
<td>3</td>
<td>CENTRAL PA ALLIANCE LABORATORY</td>
<td>1803 MT ROSE AVENUE SUITE C3-C4 YORK, PA 17403</td>
</tr>
<tr>
<td>4</td>
<td>CONNECTIVE TISSUE GENE TEST LLC</td>
<td>6580 SNOWDRIFT ROAD SUITE 300 ALLENTOWN, PA 18106</td>
</tr>
<tr>
<td>5</td>
<td>CPTA HISTOCOMPATIBILITY LAB</td>
<td>205 SOUTH FRONT STREE, BRADY HALL 7TH FLOOR HARRISBURG, PA 17104</td>
</tr>
<tr>
<td>6</td>
<td>FAMILY PRACTICE CENTER DIAGNOSTIC CNTR</td>
<td>1 DOCK HILL ROAD MIDDLEBURG, PA 17842</td>
</tr>
<tr>
<td>7</td>
<td>GEISINGER HEALTH SYSTEM</td>
<td>200 SCENERY DRIVE STATE COLLEGE, PA 16801</td>
</tr>
<tr>
<td>8</td>
<td>HEALTH NETWORK LABORATORIES</td>
<td>1200 SOUTH CEDAR CREST BOULEVARD ALLENTOWN, PA 18103</td>
</tr>
<tr>
<td>9</td>
<td>ITXM CLINICAL SERVICES</td>
<td>320 EAST NORTH AVENUE PITTSBURGH, PA 15212</td>
</tr>
<tr>
<td>10</td>
<td>ITXM CLINICAL SERVICES</td>
<td>200 LOTHROP STREET RM 5917 MT CHP PITTSBURGH, PA 15213</td>
</tr>
<tr>
<td>11</td>
<td>ITXM DIAGNOSTICS INC</td>
<td>3636 BOULEVARD OF THE ALLIES PITTSBURGH,</td>
</tr>
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<td>#</td>
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<tr>
<td>12</td>
<td>JONES INSTITUTE AT WEST PENN ALLEGHENY HEALTH</td>
<td>4815 LIBERTY AVENUE SUITE 330 MELLON PAVILLION WEST PENN HOSPITAL, PITTSBURGH, PA 15224</td>
</tr>
<tr>
<td>13</td>
<td>KEYSTONE MEDICAL LABORATORIES</td>
<td>781 KEYSTONE INDUSTRIAL PARK, DUNMORE, PA 18512</td>
</tr>
<tr>
<td>14</td>
<td>LABORATORY CORPORATION OF AMERICA HOLDINGS</td>
<td>901 KEYSTONE INDUSTRIAL PARK, THROOP, PA 18512</td>
</tr>
<tr>
<td>15</td>
<td>LABS INC</td>
<td>401 NORTH 3RD STREET SUITE 279, PHILADELPHIA, PA 19123</td>
</tr>
<tr>
<td>16</td>
<td>LEBANON INTERNAL MEDICINE ASSOCIATES</td>
<td>755 NORMAN DRIVE, LEBANON, PA 17042</td>
</tr>
<tr>
<td>17</td>
<td>MACRO LAB GROUP</td>
<td>9150 MARSHALL STREET SUITE 5, PHILADELPHIA, PA 19114</td>
</tr>
<tr>
<td>18</td>
<td>MARLBOROUGH HOLDINGS LLC DBA PENNSYLVANIA</td>
<td>339 OLD HAYMAKER ROAD STE 1700, MONROEVILLE, PA 15146</td>
</tr>
<tr>
<td>19</td>
<td>NATIONAL MEDICAL SERVICES INC</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>PATHOLOGY DIAGNOSTICS LABORATORY</td>
<td>245 N 15TH ST, NEW COLLEGE BLDG 5TH FLOOR ROOM 5130, PHILADELPHIA, PA 19102</td>
</tr>
<tr>
<td>21</td>
<td>PENN CUTANEOUS PATHOLOGY SERVICES</td>
<td>3700 MARKET STREET 3RD FLR STE 312, PHILADELPHIA, PA 19104</td>
</tr>
<tr>
<td>22</td>
<td>PENN MEDICINE AT RADNOR</td>
<td>250 KING OF PRUSSIA ROAD, RADNOR, PA 19087</td>
</tr>
<tr>
<td>23</td>
<td>PENNJIE LABORATORY SERVICES LLC</td>
<td>2591 BAGLYOS CIRCLE SUITE C48, BETHLEHEM, PA 18020</td>
</tr>
<tr>
<td>24</td>
<td>PERKINELMER GENETICS INC</td>
<td>90 EMERSON LANE SUITE 1403, BRIDGEVILLE, PA 15017</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PO BOX 219</td>
</tr>
<tr>
<td>25</td>
<td>QUEST DIAGNOSTICS CLINICAL LABS INC</td>
<td>900 BUSINESS CENTER DRIVE, HORSHAM, PA 19044</td>
</tr>
<tr>
<td>26</td>
<td>QUEST DIAGNOSTICS CLINICAL LABS INC</td>
<td>800 BUSINESS CENTER DRIVE, HORSHAM, PA 19044</td>
</tr>
<tr>
<td>27</td>
<td>QUEST DIAGNOSTICS OF PENNSYLVANIA INC</td>
<td>875 GREENTREE ROAD 4 PARKWAY CENTER, PITTSBURGH, PA 15220</td>
</tr>
<tr>
<td>28</td>
<td>QUEST DIAGNOSTICS VENTURE LLC</td>
<td>875 GREENTREE ROAD 4 PARKWAY CENTER, PITTSBURGH, PA 15220</td>
</tr>
</tbody>
</table>

Source: [http://www.cms.gov/CLIA/20_CLIA_Laboratory_Demographic_Information.asp?CLIANum=&LabName=&GeoCity=&state=PA&GeoZip=&appType=3&isSubmitted=clia2 Accessed 7/6/10](http://www.cms.gov/CLIA/20_CLIA_Laboratory_Demographic_Information.asp?CLIANum=&LabName=&GeoCity=&state=PA&GeoZip=&appType=3&isSubmitted=clia2 Accessed 7/6/10).
### 8.5 Appendix 5—Pennsylvania Insurance Companies by Membership

**Insurance Summary by Membership—Condensed**

<table>
<thead>
<tr>
<th>Statement as of 12/31/2009</th>
<th>Total # of Members</th>
<th>Comprehensive (Hospital and Medicare)</th>
<th>Medicare Supplement</th>
<th>Federal Employees Health Benefit Plan</th>
<th>Title XVIII Medicare</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Individual</td>
<td>Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Highmark Inc.</strong></td>
<td>1,634,842</td>
<td>143,495</td>
<td>893,136</td>
<td>195,612</td>
<td>195,415</td>
</tr>
<tr>
<td><strong>Keystone Health Plan West, Inc.</strong></td>
<td>262,504</td>
<td>72,997</td>
<td>21,999</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>1,897,346</td>
<td>216,492</td>
<td>915,135</td>
<td>195,612</td>
<td>195,415</td>
</tr>
<tr>
<td><strong>Independence Blue Cross (IBC)</strong></td>
<td>78,161</td>
<td>11,286</td>
<td>5,761</td>
<td>58,601</td>
<td>0</td>
</tr>
<tr>
<td><strong>QCC Insurance Company</strong></td>
<td>545,248</td>
<td>27,217</td>
<td>460,574</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Keystone Health Plan East, Inc.</strong></td>
<td>726,887</td>
<td>70,377</td>
<td>513,060</td>
<td>0</td>
<td>24,980</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>1,350,296</td>
<td>108,880</td>
<td>979,395</td>
<td>58,601</td>
<td>24,980</td>
</tr>
<tr>
<td><strong>Capital BlueCross</strong></td>
<td>115,398</td>
<td>4,636</td>
<td>13,652</td>
<td>30,469</td>
<td>0</td>
</tr>
<tr>
<td><strong>Capital Advantage Insurance Company</strong></td>
<td>331,911</td>
<td>12,703</td>
<td>278,614</td>
<td>30,469</td>
<td>0</td>
</tr>
<tr>
<td><strong>Keystone Health Plan Central, Inc.</strong></td>
<td>89,221</td>
<td>24,515</td>
<td>45,267</td>
<td>0</td>
<td>2,054</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>536,530</td>
<td>41,854</td>
<td>337,533</td>
<td>60,938</td>
<td>2,054</td>
</tr>
<tr>
<td><strong>Aetna, Inc.</strong></td>
<td>391,523</td>
<td>35,908</td>
<td>297,223</td>
<td>0</td>
<td>16,593</td>
</tr>
<tr>
<td><strong>Inter-County Health Plans, Inc.</strong></td>
<td>20,967</td>
<td>242</td>
<td>17,818</td>
<td>2,907</td>
<td>0</td>
</tr>
<tr>
<td><strong>AmeriHealth HMO, Inc</strong>**</td>
<td>8,600</td>
<td>15</td>
<td>8,585</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Source: Pennsylvania Insurance Department; data from 12/31/2009.*

**Note:** One member may equal several member of a family who are on the policy; only selected types of insurance are shown on this abbreviated report, so the types of insurance do not equal the total members.

*50% owned by Highmark and 50% owned by IBC.

**Affiliated with both Independence Blue Cross and Inter-County Health Plans.
### 8.6 Appendix 6—Largest Pennsylvania Employers

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company Name</th>
<th>City</th>
<th>Revenues (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AmerisourceBergen</td>
<td>Chesterbrook</td>
<td>71,789.00</td>
</tr>
<tr>
<td>2</td>
<td>Comcast</td>
<td>Philadelphia</td>
<td>35,756.00</td>
</tr>
<tr>
<td>3</td>
<td>Sunoco</td>
<td>Philadelphia</td>
<td>29,630.00</td>
</tr>
<tr>
<td>4</td>
<td>Rite Aid</td>
<td>Camp Hill</td>
<td>26,289.50</td>
</tr>
<tr>
<td>5</td>
<td>PNC Financial Services Group</td>
<td>Pittsburgh</td>
<td>19,231.00</td>
</tr>
<tr>
<td>6</td>
<td>Cigna</td>
<td>Philadelphia</td>
<td>18,414.00</td>
</tr>
<tr>
<td>7</td>
<td>Aramark</td>
<td>Philadelphia</td>
<td>12,297.90</td>
</tr>
<tr>
<td>8</td>
<td>PPG Industries</td>
<td>Pittsburgh</td>
<td>12,239.00</td>
</tr>
<tr>
<td>9</td>
<td>United States Steel</td>
<td>Pittsburgh</td>
<td>11,048.00</td>
</tr>
<tr>
<td>10</td>
<td>H.J. Heinz</td>
<td>Pittsburgh</td>
<td>10,148.10</td>
</tr>
<tr>
<td>11</td>
<td>Lincoln National</td>
<td>Radnor</td>
<td>9,071.80</td>
</tr>
<tr>
<td>12</td>
<td>Air Products and Chemicals</td>
<td>Allentown</td>
<td>8,381.40</td>
</tr>
<tr>
<td>13</td>
<td>Crown Holdings</td>
<td>Philadelphia</td>
<td>7,938.00</td>
</tr>
<tr>
<td>14</td>
<td>PPL</td>
<td>Allentown</td>
<td>7,585.00</td>
</tr>
<tr>
<td>15</td>
<td>UGI</td>
<td>King of Prussia</td>
<td>5,737.80</td>
</tr>
<tr>
<td>16</td>
<td>SunGard Data Systems</td>
<td>Wayne</td>
<td>5,508.00</td>
</tr>
<tr>
<td>17</td>
<td>Hershey</td>
<td>Hershey</td>
<td>5,298.70</td>
</tr>
<tr>
<td>18</td>
<td>Universal Health Services</td>
<td>King of Prussia</td>
<td>5,202.40</td>
</tr>
<tr>
<td>19</td>
<td>Mylan</td>
<td>Canonsburg</td>
<td>5,092.80</td>
</tr>
<tr>
<td>20</td>
<td>Wesco International</td>
<td>Pittsburgh</td>
<td>4,624.00</td>
</tr>
<tr>
<td>21</td>
<td>Consol Energy</td>
<td>Canonsburg</td>
<td>4,621.90</td>
</tr>
<tr>
<td>22</td>
<td>Unisys</td>
<td>Blue Bell</td>
<td>4,597.70</td>
</tr>
<tr>
<td>23</td>
<td>Dick's Sporting Goods</td>
<td>Coraopolis</td>
<td>4,412.80</td>
</tr>
<tr>
<td>24</td>
<td>Airgas</td>
<td>Radnor</td>
<td>4,349.50</td>
</tr>
<tr>
<td>25</td>
<td>Erie Insurance Group</td>
<td>Erie</td>
<td>4,255.40</td>
</tr>
</tbody>
</table>

**Note:** With 25 headquarters, Pennsylvania ranks 5th in states with the most Fortune 500 companies’ headquarters. Texas and California each have 57; New York has 56, and Illinois has 31.

### 50 Largest Pittsburgh Area Employers*

<table>
<thead>
<tr>
<th>Rank/Name of Employer—2008 Website</th>
<th># Local Employees**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. University of Pittsburgh Medical Center (UPMC)</td>
<td>36,700</td>
</tr>
<tr>
<td>2. U.S. Government</td>
<td>18,738</td>
</tr>
<tr>
<td>3. Commonwealth of Pennsylvania</td>
<td>13,805</td>
</tr>
<tr>
<td>4. Giant Eagle, Inc.</td>
<td>10,440</td>
</tr>
<tr>
<td>5. West Penn Allegheny Health System</td>
<td>10,616</td>
</tr>
<tr>
<td>6. University of Pittsburgh</td>
<td>11,328</td>
</tr>
<tr>
<td>7. Wal-Mart Stores, Inc.</td>
<td>10,030</td>
</tr>
<tr>
<td>8. PNC Financial Services Group, Inc.</td>
<td></td>
</tr>
<tr>
<td>9. Allegheny County</td>
<td></td>
</tr>
<tr>
<td>10. Mellon Financial Corp.</td>
<td></td>
</tr>
<tr>
<td>11. Highmark, Inc.</td>
<td></td>
</tr>
<tr>
<td>12. Eat'n Park Hospitality Group, Inc.</td>
<td></td>
</tr>
<tr>
<td>13. Board of Education (Pittsburgh)</td>
<td></td>
</tr>
<tr>
<td>15. Verizon Communications</td>
<td></td>
</tr>
<tr>
<td>16. United States Steel Corp.</td>
<td></td>
</tr>
<tr>
<td>17. Heritage Valley Health System</td>
<td></td>
</tr>
<tr>
<td>19. United Parcel Service</td>
<td></td>
</tr>
<tr>
<td>20. Excela Health</td>
<td></td>
</tr>
<tr>
<td>21. Pittsburgh Mercy Health System</td>
<td></td>
</tr>
<tr>
<td>22. Allegheny Technologies, Inc.</td>
<td></td>
</tr>
<tr>
<td>24. City of Pittsburgh</td>
<td></td>
</tr>
<tr>
<td>25. Port Authority of Allegheny County</td>
<td></td>
</tr>
<tr>
<td>26. FedEx Ground</td>
<td></td>
</tr>
<tr>
<td>27. PPG Industries, Inc.</td>
<td></td>
</tr>
<tr>
<td>28. CONSOL Energy, Inc.</td>
<td></td>
</tr>
<tr>
<td>29. Children's Hospital of Pittsburgh of UPMC</td>
<td></td>
</tr>
<tr>
<td>30. Comcast</td>
<td></td>
</tr>
<tr>
<td>31. US Airways Group, Inc.</td>
<td></td>
</tr>
<tr>
<td>32. Macy's</td>
<td></td>
</tr>
<tr>
<td>33. National City Bank of Pennsylvania</td>
<td></td>
</tr>
<tr>
<td>34. Duquesne University</td>
<td></td>
</tr>
<tr>
<td>35. Westmoreland County</td>
<td></td>
</tr>
<tr>
<td>36. Alcoa, Inc.</td>
<td></td>
</tr>
<tr>
<td>37. Allegheny Energy Inc.</td>
<td></td>
</tr>
<tr>
<td>38. Citizens Bank of Pennsylvania</td>
<td></td>
</tr>
</tbody>
</table>

*Copyright PAeHI 2010-11*
# Financing Research & Framework Development for a HIE

## 50 Largest Pittsburgh Area Employers*

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name of Employer—2008 Website</th>
<th># Local Employees**</th>
</tr>
</thead>
<tbody>
<tr>
<td>39.</td>
<td>Washington Hospital</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td>Siemens</td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>Jefferson Regional Medical Center</td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>St. Clair Hospital</td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>Respironics Inc.</td>
<td></td>
</tr>
<tr>
<td>44.</td>
<td>AK Steel, Inc.</td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>Grane Healthcare</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>Bayer Corp.</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>Eckerd Corp.</td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>YMCA of Greater Pittsburgh</td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>National Real Estate Information Services</td>
<td></td>
</tr>
</tbody>
</table>


## 2008 Top Nongovernmental Employers in the Philadelphia Region

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company Name</th>
<th>Employees</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>University of Pennsylvania/University of Pennsylvania Health System</td>
<td>34,868</td>
<td>Hospitals; medical school; university* (Penn 20,381; UPHS 14,487)</td>
</tr>
<tr>
<td>2</td>
<td>Jefferson Health System / Thomas Jefferson University</td>
<td>32,795</td>
<td>Hospitals; University* (Jefferson Health System 27,895; Thomas Jefferson University 4,900)</td>
</tr>
<tr>
<td>3</td>
<td>Catholic Archdiocese</td>
<td>15,400</td>
<td>Roman catholic religious schools, parishes, service agencies, churches*</td>
</tr>
<tr>
<td>4</td>
<td>Comcast Corp.</td>
<td>12,795</td>
<td>Cable TV, Internet, phone</td>
</tr>
<tr>
<td>5</td>
<td>Temple University/Temple University Health System</td>
<td>12,563</td>
<td>Hospitals; university**(partial state-funded)**</td>
</tr>
<tr>
<td>6</td>
<td>Merck &amp; Co., Inc.</td>
<td>12,500</td>
<td>Drug development and manufacturing</td>
</tr>
<tr>
<td>7</td>
<td>Catholic Health East</td>
<td>11,834</td>
<td>Hospitals</td>
</tr>
<tr>
<td>8</td>
<td>Supervalu, Inc.</td>
<td>11,400</td>
<td>Grocery stores</td>
</tr>
<tr>
<td>9</td>
<td>Lockheed Martin Corp.</td>
<td>11,007</td>
<td>Military radar systems</td>
</tr>
<tr>
<td>10</td>
<td>Christiana Care Health System</td>
<td>10,790</td>
<td>Hospitals</td>
</tr>
<tr>
<td>11</td>
<td>Wal-Mart Stores, Inc.</td>
<td>10,427</td>
<td>Discount retail stores</td>
</tr>
<tr>
<td>Rank</td>
<td>Company Name</td>
<td>Employees</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------</td>
<td>-----------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>12</td>
<td>United Parcel Service, Inc.</td>
<td>9,919</td>
<td>Package shipping, delivery</td>
</tr>
<tr>
<td>13</td>
<td>E.I. du Pont de Nemours and Co.</td>
<td>9,484</td>
<td>Chemical products</td>
</tr>
<tr>
<td>14</td>
<td>Aramark Corp.</td>
<td>9,450</td>
<td>Food service</td>
</tr>
<tr>
<td>15</td>
<td>Vanguard Group, Inc.</td>
<td>9,200</td>
<td>Mutual funds, asset management</td>
</tr>
<tr>
<td>16</td>
<td>Children's Hospital of Philadelphia (CHOP)</td>
<td>9,150</td>
<td>Hospital</td>
</tr>
<tr>
<td>17</td>
<td>Verizon Communications, Inc.</td>
<td>8,800</td>
<td>Phone, Internet, video</td>
</tr>
<tr>
<td>18</td>
<td>Koninklijke Ahold NV</td>
<td>8,195</td>
<td>Grocery stores</td>
</tr>
<tr>
<td>19</td>
<td>Wawa, Inc.</td>
<td>8,170</td>
<td>Convenience stores</td>
</tr>
<tr>
<td>20</td>
<td>Wakefern Corp.</td>
<td>8,151</td>
<td>ShopRite grocery stores</td>
</tr>
<tr>
<td>21</td>
<td>Independence Blue Cross and affiliates</td>
<td>8,004</td>
<td>Health insurance*</td>
</tr>
<tr>
<td>22</td>
<td>Bank of America Corp.</td>
<td>8,000</td>
<td>Credit cards; investments; banking</td>
</tr>
<tr>
<td>23</td>
<td>Virtua Health</td>
<td>7,716</td>
<td>Hospitals</td>
</tr>
<tr>
<td>24</td>
<td>Siemens AG</td>
<td>7,583</td>
<td>Medical equipment and systems</td>
</tr>
<tr>
<td>25</td>
<td>Drexel University</td>
<td>7,300</td>
<td>University*</td>
</tr>
<tr>
<td>26</td>
<td>Crozer-Keystone Health System</td>
<td>7,200</td>
<td>Hospitals *</td>
</tr>
<tr>
<td>27</td>
<td>CVS Caremark Corp.</td>
<td>7,200</td>
<td>Pharmacy; drug distribution</td>
</tr>
<tr>
<td>28</td>
<td>Sears Holding Corp.</td>
<td>7,000</td>
<td>Department stores</td>
</tr>
<tr>
<td>29</td>
<td>Toronto Dominion Bank</td>
<td>6,914</td>
<td>Retail and commercial bank</td>
</tr>
<tr>
<td>30</td>
<td>US Airways Inc.</td>
<td>6,528</td>
<td>Airline</td>
</tr>
<tr>
<td>31</td>
<td>JP Morgan Chase &amp; Co.</td>
<td>6,500</td>
<td>Credit cards; investments; banking</td>
</tr>
<tr>
<td>32</td>
<td>Wachovia Corp.</td>
<td>6,401</td>
<td>Retail and commercial bank</td>
</tr>
<tr>
<td>33</td>
<td>Target Corp.</td>
<td>6,360</td>
<td>Discount retail stores</td>
</tr>
<tr>
<td>34</td>
<td>Genesis Healthcare Corp.</td>
<td>6,224</td>
<td>Nursing homes</td>
</tr>
<tr>
<td>35</td>
<td>Home Depot USA, Inc.</td>
<td>6,113</td>
<td>Retail construction materials</td>
</tr>
<tr>
<td>36</td>
<td>GlaxoSmithKline plc</td>
<td>5,934</td>
<td>Drug development and manufacturing</td>
</tr>
<tr>
<td>37</td>
<td>PNC Financial Services Group, Inc.</td>
<td>5,900</td>
<td>Retail and commercial bank; investments</td>
</tr>
<tr>
<td>38</td>
<td>Abington Memorial Hospital</td>
<td>5,788</td>
<td>Hospital</td>
</tr>
<tr>
<td>39</td>
<td>Sodexo, Inc.</td>
<td>5,777</td>
<td>Food service</td>
</tr>
</tbody>
</table>
2008 Top Nongovernmental Employers in the Philadelphia Region

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company Name</th>
<th>Employees</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Bayada Nurses, Inc.</td>
<td>5,429</td>
<td>Health-care nursing services</td>
</tr>
<tr>
<td>41</td>
<td>Wyeth</td>
<td>5,341</td>
<td>Drug development and manufacturing</td>
</tr>
<tr>
<td>42</td>
<td>Cooper Health System</td>
<td>5,284</td>
<td>Hospitals</td>
</tr>
<tr>
<td>43</td>
<td>Boeing Co.</td>
<td>5,135</td>
<td>Military rotorcraft</td>
</tr>
<tr>
<td>44</td>
<td>Johnson &amp; Johnson</td>
<td>5,100</td>
<td>Drug development and manufacturing*</td>
</tr>
<tr>
<td>45</td>
<td>Safeway, Inc.</td>
<td>5,100</td>
<td>Grocery stores</td>
</tr>
<tr>
<td>46</td>
<td>Allied Security Holdings</td>
<td>5,053</td>
<td>Security services</td>
</tr>
<tr>
<td>47</td>
<td>Great Atlantic &amp; Pacific Tea Co.</td>
<td>5,000</td>
<td>Grocery stores</td>
</tr>
<tr>
<td>48</td>
<td>Sunoco, Inc.</td>
<td>4,987</td>
<td>Oil refining and marketing; convenience stores</td>
</tr>
<tr>
<td>49</td>
<td>Tenet Healthcare Corp.</td>
<td>4,810</td>
<td>Hospitals</td>
</tr>
<tr>
<td>50</td>
<td>AstraZeneca P.L.C.</td>
<td>4,600</td>
<td>Drug development and manufacturing</td>
</tr>
</tbody>
</table>


8.7 Appendix 7—HIE Stakeholder Benefits

Benefits to Hospitals

- Key benefits:
  - Enhance capability to maintain a competitive position with the marketplace.
  - Improve quality and efficiency of coordinated care related to data exchange across organizations.
  - Enhance capability to achieve Meaningful Use.

- Reduce costs and improve the effectiveness of services:
  - Lower cost delivery of results and reports through clinical messaging.
  - Access inquiry function for key clinical and administrative date by ED and other providers.
  - Reduce costs of care in the ED for uninsured and under-insured by having all patient data at the point of care.
  - Reduce costs of care for employees by reducing inefficient and redundant care.

- Improve physician and health system relations:
  - Maintain and sustain strong relations with physicians and other providers.
  - Have low-cost data exchange user tools (messaging, referrals, and inquiry) and, potentially, ePrescribing and Web-based certified EHR.
- Improve an organization’s capability to provide quality care:
  o Have access to Inquiry function for key clinical and administrative data, such as the CCD, by Emergency Department, and other providers enabling access to clinical data from multiple organizations at the point of care.
  o Have capability to exchange clinical messages across organizations regardless of the level of HIT/HIE adoption.
  o Have inquiry and clinical messaging functions to support Patient Centered Medical Home models and quality and safety initiatives.
  o Have ability to do medication reconciliations from hospital pharmacy to community physicians.

- Improve effective utilization of resources:
  o Have easy access to data exchange through the HIE without extensive point-to-point interfacing.
  o Have easy interface with diverse community EHR products.
  o Rely on the HIE to solve complex policy and regulatory issues such as privacy and security, data exchange contracting, data exchange across state lines, and other complex issues as they emerge.

**Benefits to Physicians**

- Reduce costs and improve the effectiveness of practice delivery:
  o Streamline the practice workflow through use of clinical messaging, inquiry, and ePrescribing.
  o Make it easier for office staff and the care giver to communicate.
  o Have access to key data when they need it through inquiry and portal functions.

- Reduce costs and improve billings:
  o Have access to basic administrative tools through Web-based EHR.
  o Have access to health plan billing information through the HIE portal.

- Improve the ability of physicians to provide quality care:
  o Have access to relevant patient data at the point of care regardless of where the clinician is located.
  o Have access to provider and payer tools through the HIE.
  o Have direct data feeds into practice EHRs and patient registries.
  o Have ability to coordinate with other care providers such as behavioral health professionals and pharmacists among many others.

- Ready physicians for compliance with Meaningful Use and payer performance measures:
  o HIE can coordinate with regional extension center to select, purchase, and implement certified EHR.
  o Have access to HIE-based low cost and certified EHR.
- Enable patient loyalty:
  - Have use of HIE messaging and inquiry tools to improve timeliness of communication with patient.
  - Reduce canceled appointments.
  - Provide patient with electronic records of visits and results.

**Benefits to Payers**

- Meet needs of stakeholders:
  - Maintain service to members by supporting care coordination initiatives that improve quality, efficiency, and outcomes.
  - Improve service to employers through support of initiatives to address their concerns about quality, value, and cost.

- Improve quality and value:
  - Enable greater coordination of care through use of the HIE—clinical messaging, inquiry across organizations, ePrescribing, orders, personal health record (PHR), patient portals and more.

- Improve cost effectiveness of care:
  - Reduce duplication of testing resulting from inconsistent access to patient data from multiple organizations.
  - Reduce prescription drug costs through use of ePrescribing, appropriate medication use, and increased use of generics.
  - Reduce readmissions with the same diagnosis through better care coordination during transitions of care.

- Increase access to tools:
  - Provide access to payer tools (claims, eligibility, ePrescribing, and such) through HIE portal.
  - Provide HIE and payer tools to support health plan medical management and pay for performance initiatives to improve quality, outcomes, and cost:
    - Registries to improve compliance with HEDIS measures associated with chronic disease management and preventative services.
    - Clinical decision support and analytics tools to generate reminders of needed services and to support compliance with evidence-based guidelines and provide meaningful user reporting.
      - Clinical messaging.
      - Access to information from multiple providers.
      - May also include registries and PHR.

- Opportunities to improve health plan efficiency:
  - Provide access to plan systems (eligibility, ePrescribing, HEDIS audit, and such) using HIE portal.
  - Use HIE/payer PHR to complete some transactions with members, for example EOBs.
Benefits to Others

1. Emergency Departments:
   - Have access to streamlined and fast connections to physicians, labs, images, and others.
   - Easily view relevant patient clinical and administrative information.
   - Reduce duplicate testing, inappropriate care, and medication errors.

2. Public health agencies:
   - Receive reportable conditions electronically for faster processing and earlier disease detection
   - Able to send alerts to provider community
   - Have access to greater information for surveillance
   - Able to more easily integrate data from disparate sources

3. Safety net clinics and critical access hospitals:
   - Have same benefits as physicians and hospitals
   - Can move more quickly from paper to electronic transactions
   - HIE can serve as a low cost integrated network to provide coordinated care

4. Long-term care and other providers:
   - Can send and receive referral information between providers
   - Able to improve transitions of care and reduce inappropriate care and hospital readmissions
   - Have access to relevant patient information at the point of care

5. Pharmacies/Pharmacists:
   - Access to labs and diagnostic codes
   - Faster prior authorization from payers with claims exchange
   - Quicker resolution of prescribing issues

6. Labs:
   - Decrease cost of results delivery to paper-based physicians
   - Reduce in interface cost

7. Radiology:
   - Decrease cost of results delivery
   - Have potential for radiology images to be shared across the community
   - Can more effectively utilize of advanced radiology to improve prevention, chronic disease management, and patient participation in care.

8. Researchers:
   - Able to obtain data feeds for longitudinal data analysis
   - Have access to additional data from more sources

9. Employers:
• Have potential to reduce premium rate growth through improvement in both quality and value of care
• Improve quality and value through transparency of quality of care measures for employees
• Improve quality and value through employee participation in their own care
• Reduce absenteeism through improved management of chronic care conditions

10. Consumers:
• Reduce wait time for lab and radiology results and possible canceled appointments.
• Receive improved care due to greater care coordination and medication management.
• Work more effectively with multiple physicians.
• Actively participate in own care through the personal health record and other advanced tools around prevention and chronic disease management.
• Reduce co-pays for duplicate testing and inappropriate care due to provider lack of information.
### Capital Area RHIO

#### Interview Summary

**What Makes Capital Area RHIO Unique**

The Capital Area RHIO has been highly successful at obtaining widespread financial participation by many stakeholder groups. It has achieved this by 1) obtaining strong physician leadership; 2) hosting of key leadership meetings by the university; 3) having a deep understanding of benefits for each stakeholder organization; 4) working with each organization to build the business case including an ROI analysis for each one; 5) engaging Medicaid and state agencies as participating stakeholders; and 6) addressing stakeholder barriers such as governance through a community process. Another Medical Trading Area, MIHIA in Central Michigan, is in discussions with Capital Area RHIO to use the RHIOs HIE infrastructure while maintaining local governance control.

#### Background

<table>
<thead>
<tr>
<th>Year Organization Started</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year HIE Implemented</td>
<td>Pilot in 2010</td>
</tr>
</tbody>
</table>

**Mission and Strategy**

The Capital Area RHIO will be a vehicle for enhancing health -- quality, safety, efficiency, and effectiveness in Mid-Michigan, by providing tools for secure digital exchange and access to pertinent patient health information, with ease of use a hallmark for clinical information sources and patient care clinicians.

**Services**

- Clinical Exchange

**Geographic Reach and Primary Location**

Michigan's Clinton, Eaton, and Ingham Counties; Primary location: Lansing, Michigan

**Governance Structure**

Capital Area RHIO is a 501(c)(3) multi-stakeholder organization. The Board of Directors includes health systems, physicians, other providers, payers, public health, State of Michigan, health alliance, university, and the community college.

**Stakeholders**

Michigan State University (MSU), Sparrow Health, Ingham County Health Dept., Ingham Regional Medical Center, Hayes Green Beach Hospital, State of Michigan (Medicaid, Office of the State Employer, and Office of State Retirees), Lansing Community College, Capital Area Health Alliance, and Community Mental Health.

**Functionality**

1) Connectivity; 2) clinician messaging; 3) virtual health record for access to a community wide view of patient data; 4) web-based EMR "light"; 5) ePrescribing; 6) Integration with existing physician EMRs; 7) integration with institutional EMRs; 8) physician's staff role based access; 9) local support and training; 10) privacy and security; and 11) enterprise Master Patient Index. Product is 2008 CCHIT certified.

**Technology**

Axolotl Interoperability hub to exchange data from disparate sources and Elysium applications noted above.

**Participants**

Three hospitals, physicians, community mental health, and local public health dept.

**Volume of Activity**

Major stakeholders generate over 4.7 million results plus copies to multiple providers for a total of 6.3 million transactions. When fully implemented Capital Area RHIO will be taking over these transactions. Approximately 335 physicians in 8 practices have agreed to participate and will be implemented within 18 months of the initial pilot that begins in November 2010.
## Capital Area RHIO

### Interview Summary

#### Current Growth Plans
MiHiA serves the central region Medical Trading Area including 14 counties and a population of 776,000. MiHiA is interested in “fast tracking” to HIE through the Capital Area RHIO to take advantage of its operating positioning, duplicable systems, and policies and procedures. The RHIO will benefit from MiHiA work on PHR. This will enable both regions to achieve economies of scale. The RHIO already has capacity for 3 million people. This has the approval of the Michigan Department of Community Health and the boards of both organizations.

#### General

**Business Model**
Engage physician leaders and build model based on their requirements; provide efficiency gains to hospitals; identify benefits; and engage other providers.

**Current Issues and How to Address Them**
The relationship with the state-level HIE is still being resolved. In the past, the state-level HIE has used a similar benefits and return on investment rationale that the Capital Area RHIO used. How can we sell our services when the perception is that we are competing with each other?

**Meaningful Use Impact**
The RHIO is providing an EHR as an option that includes patient demographics, clinical health information such as medical history and problem lists.

#### Financial

**Business Model**
Obtain financial participation by all stakeholder groups, not just a few. Establish fee structures that meet needs of and result in a favorable ROI for each stakeholder. Obtain commitment through physician leadership and community leadership.

**HIE Start-up Costs**
In 2006, the Capital Area Health Alliance launched the planning process, which qualified for federal matching funds. Ingham Regional Medical Center, Michigan State University and Sparrow Health System each contributed $100,000 to be eligible for the match. In 2007, the Capital Area Health Alliance received a state grant for $1.4 million to implement the RHIO.

**Annual Costs**
$2 million serving 450,000 - 500,000 patients annually

**Fee Structure**
Fees are allocated to stakeholder groups as follows: 19% community memberships; 18% health systems; 17% physicians; 13% health plans, 13% self-funded employers; 11% Medicaid; and 9% research capacity building.

- **Hospitals** -- Fees based on benefits received as a data sender.
- **Physicians** -- Fees based on services provided and benefits received. Charges are under $100 for EMR hook up and under $150/mo. per physician for Web-based EMR, with ePrescribing.
- **Payers** -- $0.25 per member per month for Medicaid, Office of State Employees and Office of State Retired Employees and Physicians Health Plan, which is owned by the Sparrow Health System.
- **Others** -- Academic Research based on benefits received and Community Membership for Board seat at $35,000 per year.

**Obtaining Agreement on Fee Structure**
This was a lengthy process. All stakeholders agreed to pay, but no one wanted to pay more than their fair share. So, we did a confidential return on investment analysis (ROI) for each stakeholder to identify reasonable fees for each organization, within a stakeholder group and across stakeholder groups. Hospitals are paying a data sender fee; public health is paying a surveillance and alerts fee; MSU is paying a research capacity fee; Board members are paying a community membership fee; payers are paying a per member per month fee based on number of covered lives; and physicians are paying for RHIO services used. Some groups are paying multiple fees if they fall into multiple categories such as MSU which is paying Board, physician, research and self-funded payer fees.

**Benefits and ROI**
We did a benefits and ROI analysis for each organization. For example, hospital ROI was based on improved efficiencies from HIE results delivery. Payer ROI was based on improved outcomes and reduction in duplicate testing.

**HIE Participation**
# Capital Area RHIO
## Interview Summary

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>There are 800 practicing physicians out of 1200 in the region. The business plan assumes RHIO adoption by 650 physicians within 18 months of start-up. Several large groups have made commitments to participation, and we have begun implementing them. Staff and physician leadership is in the process of reaching out to independent groups. Some practices have EMRs while others are still paper based. It is most difficult to obtain commitment from those without EMRs. Physician leadership has been the key to our success.</td>
</tr>
<tr>
<td>State of Michigan and Medicaid</td>
<td>State of Michigan is a participating payer through Medicaid, Office of State Employees and Office of State Retirees. Each pays $0.25 per member per month. Lansing is the state capital and the state has a high vested interest in health care for its employees.</td>
</tr>
<tr>
<td>Public Health</td>
<td>Participants include the county health department which invested in the RHIO. Functionality of the RHIO reflects public health reporting needs.</td>
</tr>
<tr>
<td>Regional Extension Center</td>
<td>We are in discussion with them to steer physicians to the RHIO when signing them up for EMRs. The two groups need to be coordinated.</td>
</tr>
<tr>
<td>National Health Information Network (NHIN)</td>
<td>There is confusion about NHIN at this point. It doesn’t seem to be a competitive strategy for the RHIO.</td>
</tr>
<tr>
<td>Other Sources of Income</td>
<td>The RHIO is currently reaching out to nursing homes.</td>
</tr>
</tbody>
</table>

## Interviewee and Sources

**Interviewee:** Valerie Glesnes-Anderson, Interim Executive Director of Capital Area RHIO, September 2010  

**Sources:**  
Moore, John. *Michigan Regional Health Exchange Picks a Provider*, Government Health IT, April 2, 2009,  

## Franciscan HIE
### Interview Summary

**What Makes Franciscan HIE Unique**

Franciscan HIE is a physician driven organization inspired by the energy of one physician leader in 1998. Since then, Franciscan HIE has grown from one hospital and a small group of physicians in the rural Olympic Peninsula to 617 organizations and 6200 user. The physicians have traditionally had a strong role in governance and the intent is for this to continue as the board reorganizes to accommodate the growth of participating organizations. Traditionally, Franciscan HIE has worked with the social services safety net agencies and this focus continues and expands.

### Background

| Year Started | 1998 |
| Year HIE Implemented | 1999 |

**Mission and Strategy**

The Franciscan HIE approach is to providing the highest quality, cost effective care by ensuring that existing EMR technologies, already in use by physicians in the region, can easily be connected to the HIE and that the HIE will provide EMR tools to practices that are not electronic so that the entire area can access the clinical network.

**Services**

Clinical Exchange and EMR tools such as documentation, voice recognition, practice re-design, ordering, patient follow-up

**Geographic Reach and Primary Location**

Ten counties in rural Washington around the Olympic Peninsula

**Governance Structure**

Previously, the HIE was hospital owned, but physician driven. The physicians were lead by the President of the Franciscan Medical Group. Physicians served as the governing board and the hospital followed their leadership. With the addition of another hospital, the HIE will become a 501(c)(3) multi-stakeholder organization.

**Stakeholders**

Stakeholders on the new Board will be represented by users of the HIE: a hospital, a rural hospital, a lab, an imaging center, other providers, human services organizations and 2-3 physician groups. Participation is open to all organizations that have physicians/licensed providers caring for patients in the region, regardless of health system affiliation.

**Functionality**

1) Clinical messaging; 2) virtual health record with essential data from across organizations; 3) Web-based EHR for physicians without an EHR; 4) referrals; 5) ePrescribing; and 6) orders. There is also workflow re-design support and onsite training.

**Technology**

ASP model Axolotl Elysium Exchange. There is voice recognition; 24/7/365 support; secure web-based platform; no software installations; no software/hardware issues; certified eRX tools; and 99.9% uptime and sub-second screen refresh. Elysium Exchange is an open, standards based solution that is offered as a software service (SaaS).

**Participants**

There are 617 organizations including 487 clinics, 20 hospitals, payer, HMO, skilled nursing sites, and others. This includes daily use by physicians in competing hospitals, HMOs, emergency departments and the region’s Military Medical Centers.

**Volume of Activity**

There are 900,000 patients in community patient index; 6,200 users (with 1,800 being caregivers), 55-65% of daily use by physicians; and more than 11 million results transmitted annually.

**HIT/HIE Initiatives**

DOD pilot, AEMR systems Integration with all major AEMR vendors

**Current Plans**

Franciscan HIE is adding a second major hospital to the HIE. This will result in 150 additional physicians (many physicians work in both hospitals) and governance will change.

## General

**Business Model**

Franciscan HIE is physician lead. It has grown by enabling all organizations that serve the physicians in the region to participate. There is a large ROI for participating organizations from improved efficiencies.
### Franciscan HIE

#### Interview Summary

<table>
<thead>
<tr>
<th>Current Issues and How to Address Them</th>
<th>Many of the hospitals in the region have systems such as Epic that are not interoperable with other vendor systems. Physicians are tired of not being able to exchange data across organizations. We would like to expand the HIE to more hospitals and physicians, but it is hard to convince hospital CEOs of this issue because they have invested so much money into the hospital solutions. How do you have an even balance on the board between hospitals and physicians? It is important for the HIE to remain physicians led. This is what we are currently working on in our new governance structure.</th>
</tr>
</thead>
</table>

#### Financial

<table>
<thead>
<tr>
<th>HIE Start-up Costs</th>
<th>$750,000 absorbed by the Franciscan Health System.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Costs</td>
<td>This information is private.</td>
</tr>
</tbody>
</table>
| Fee Structure | **Hospitals** -- There is a fee for data feeds of between $3,000 to $10,000/mo. The fee is dependent on data volumes and distribution needs. There is a set-up fee of $25,000.  
**Physician** -- There is no charge to physicians for basic data exchange. Physicians are charged $250/mo. per provider for Web-based EHR and ePrescribing.  
**Payers** -- No fee  
**Other data exchange participants** -- They are charged a fee for data feeds dependent on their volumes and distribution needs. |
| Benefits and ROI | An ROI was calculated a couple of years ago related to the savings to the hospital on reduction of manual fax and paper handling. At the time, the payback period was less than 2 years. Our conservative cost savings are $3 million per year collectively for participating providers. |

#### HIE Participation

| Physicians | There are more than 1,500 daily users and 55-65% of daily users are physicians. The HIE was started by physicians for physicians. As we expand to a multi-stake holder organization, we will remain physician led and physician centered in all we do. |
| State-level HIE and Medicaid | There is not a state HIE yet, and we will cooperate with them when they are ready. The Franciscans have many Medicaid clinics and critical access hospitals that serve Medicaid patients. |
| Regional Extension Center (REC) | We are interested in working with them when they are ready. They have a big task serving two states -- Washington and Idaho. |
| Telehealth | We are considering telehealth and are reaching out to a telehealth entity in the eastern part of the state. |
| National Health Information Network (NHIN) | We are in an active pilot with our large DoD facility, Madigan Army Medical Center. We want patient data to transport for our military personnel when they go from DoD to civilian life. The NHIN is the gateway to do that. Our plan is to directly connect to NHIN. |
| Labs and Radiology | Franciscan Health System is part of a consortium of labs and competes with LabCorp and Quest. In the future, the HIE will invite both labs to participate in the HIE. The physicians need this, and the labs want to participate. We will charge the labs a data feed charge just like with the hospitals and other participating organizations. |

#### Interviewee and Sources

**Interviewee:** Mary Kasal, Executive Director, Franciscan HIE, September 2010

**Sources:**

### HealthBridge (HB)

#### Interview Summary

**What Makes HealthBridge Unique**

Until ARRA, HealthBridge has never relied on grant income, even for start-up. Yet, HealthBridge has grown to 97% penetration of the Greater Cincinnati data exchange market by focusing on achieving critical mass of results delivery, ensuring that there is a financial return on investment for all participants, and working with the physicians to expand participation. In the last seven years, HealthBridge has achieved a 5-8% annual return. HealthBridge has achieved national recognition and further economies of scale by outsourcing its IT infrastructure and HIE knowledge to other communities.

**Background**

<table>
<thead>
<tr>
<th>Year Started</th>
<th>1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year Implemented</td>
<td>1997</td>
</tr>
</tbody>
</table>

**Mission and Strategy**

The HealthBridge mission is to improve the quality and efficiency of health care. To do this we serve as a trusted third party working with all healthcare stakeholders to facilitate an integrated and interoperable health information system.

**Services**

- Clinical Exchange

**Geographic Reach; Primary Location**

- Greater Cincinnati Tri-state region including Ohio, Indiana, and Kentucky. Primary Location: Cincinnati, Ohio

**Governance Structure**

- 501c3 subsidiary of the Health Improvement Collaborative of Greater Cincinnati, a multi-stakeholder group that spawns innovations, which is a subsidiary of the Greater Cincinnati Health Council. Founding and non-founding board members include hospital CIOs and CMOs, Academy of Medicine, Humana, Anthem (authority to name someone), the Health Commissioner for Hamilton County, and President of the Health Council.

**Functionality**

1. Clinical Messaging -- laboratory, radiology, transcription, and ADT to provider EMR, fax, or web-based EMR for clinicians without EMR; 2) web-based eligibility verification and Code Correct; 3) ePrescribing pilot; 4) Disease surveillance -- HB sends chief complaint information electronically to University of Pittsburgh to monitor possible outbreaks; 5) e-Prescribing Pilot.

**Current Initiatives**

- 1) RWJF AF4Q Project - Diabetes Disease Registry for 11 Physician Practices;
- 2) Web-based and electronic data extraction;
- 3) Quality Reporting/Performance Measurement;
- 4) Tools for Multi-Payer Medical Home Pilot;
- 5) Community-wide Clinical Data Repository;
- 6) Emergency Department Data Search;
- 7) On-demand data retrieval;

**Technology**

- Philosophy is best of breed. 1) Mirth for Integration layer and EMR hub activity (involved with NHIN and NHIN Direct); 2) Axolotl for messaging; 3) Atlas for lab ordering; 4) RxNT for eRX; and 4) Welcentive for registry and PHR. We knit them together in a modular Meaningful Use offering.

**Participants**

- Greater Cincinnati -- 29 hospitals (14 health systems), 5,500 physician users, 17 local health departments, 820 physician offices and clinics, 5 labs, and 7 radiology centers, as well as nursing homes and other providers.

- Outsourced Communities -- healthLINC (HIE) in Bloomington, Indiana; Collaborating Communities Health Information Exchange (CCHIE) in Springfield, OH; and Northeast Kentucky Regional Health Information Organization in Morehead, KY.
# HealthBridge (HB)

## Interview Summary

### Volume of Activity

HealthBridge represents 97% of the hospital sector activity in the Cincinnati region. There are 3 million clinical messages monthly (lab, radiology, transcription and ADT) to more than 5,500 physicians, and 2.5 million patients in the MPI. There are feeds to 26 ambulatory EHR vendors (60+ versions) and connections to 68 HIS/Data Provider for 10 different organizations.

### Other Background

**CDC Electronic Disease Reporting Pilot** -- Pilot is with St. Elizabeth, TriHealth and Mercy to automate mandatory disease reporting to reduce an 8 day paper process down to less than 8 minutes.

**Tri-state Regional Extension Center** -- HealthBridge was named the Regional Extension Center for Tri-state region of SW Ohio, SE Indiana, and Eastern Kentucky.

**NHIN** -- HealthBridge is part of the National Health Information Network limited production exchange to securely share live data.

**Beacon Community Grant** -- The Greater Cincinnati Beacon Collaboration, of which HealthBridge is a member, was awarded a $13.8 million to improve care processes for children with asthma and adults with diabetes.

**SSA** -- HealthBridge was awarded $1.4 million to speed up the adjudication of disability claims benefits from weeks to days using HealthBridge's network.

**CMS-C-HIEP (Transitions of Care) pilot** -- HealthBridge is participating in a CMS pilot using a CCD exchange between providers.

**2008 eHI Award** -- HealthBridge won an award from eHealthInitiative for "Aligning Incentives" for its innovative model to be the outsourced HIE for healthLINC in Bloomington, Indiana and CCHIE in Springfield, Ohio.

### Current Plans

**Greater Dayton, Ohio** -- The Greater Dayton Area Hospital Association (GDAHA) is partnering with HealthBridge to establish a Dayton HIE. The region will include over 20 hospitals starting with Premier Health Partners and the Kettering Health Network. By 2012, HealthBridge will be serving more than 50 hospitals and 7,500 physicians across Southwest Ohio.

### General

**Business Model**

HealthBridge has grown to 97% penetration of the Greater Cincinnati data exchange market by focusing on achieving critical mass of results delivery, ensuring that there is a financial return on investment for all participants, and working with the physicians to expand participation. Until ARRA, 97% of revenue was from fees including 85% from hospitals. In the last seven years, HealthBridge has achieved a 5-8% annual return. HealthBridge has achieved further economies of scale by outsourcing its IT infrastructure and HIE knowledge to other communities.

**Current Issues and How to Address Them**

**Impact of ARRA on Coordination** -- The biggest issue is where do all of these new functions belong as a result of ARRA -- HIE vs. hospital? We have the players at the board level to address this. Where should quality measures be measured and reported? Do we have a common community registry or does every EHR have its own? We have a lot of providers using the Epic system. When do we use Epic Everywhere vs. community HIE?

**Stakeholder buy-in and sustainability** -- These are not issues for us. We will be 10% profitable again this year.

**Meaningful Use Impact**

We want to be a one-stop shop for Meaningful Use (MU) for physicians including care coordination and disease management. We want to be the layer between the primary care physician and the specialist. We have a REC that is a natural extension of HealthBridge. HealthBridge can connect EHR, Registry, and PHR to the HIE. With Beacon, we are going to demonstrate a whole community at Meaningful Use.

### Financial

**HIE Start-up Costs**

In 1997, HealthBridge started with $1.75 million in loans. We paid back $1,000,000 on that. There were no HIEs back then. Hospitals wanted a way to get their money back. Loans are due in 2014, but HealthBridge is paying the loans back early. Equipment start-up -- started with a portal (low cost), and then did messaging which required $2 million in capital.
## HealthBridge (HB)
### Interview Summary

<table>
<thead>
<tr>
<th><strong>Annual Costs</strong></th>
<th><strong>Fee Structure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual budget</strong></td>
<td><strong>Hospitals</strong> -- Subscription fees for messaging for content providers based on size and market. This is a flat fee that decreases as volume grows. It is nominal for a small rural hospital and can be tens of thousands for large IDNs. Charge for CPOE lab ordering (per session). Also, CPOE lab fee (per session).</td>
</tr>
<tr>
<td>Currently, $6.1 million. Budget in next two years will increase to $12 million per year. This includes expanded scope with Beacon and REC. Budget would be roughly $13 million with Greater Dayton HIE.</td>
<td><strong>Labs</strong> -- Subscription fee for messaging for content providers based on size and market.</td>
</tr>
<tr>
<td><strong>Fee Structure</strong></td>
<td><strong>Physicians</strong> -- No charge for basic messaging, EMR Lite, or portal. Charge for physicians with an EMR feed ($30/mo. per physician for max of $300 per group). Optional services -- registry, ePrescribing, PQRI ($500 annual), CPOE lab (per session fee), and eligibility ($0.25 look up charge. No charge for first $50).</td>
</tr>
<tr>
<td><strong>Approach to Fees</strong> -- HealthBridge obtains 85% of its operational revenue from subscription fees charged to health systems. The region has 97% HIE adoption and is not grant dependent. We try to match fees to how that segment thinks about fees. A flat fee for hospitals incentivizes higher volumes. Physician charges are nominal to avoid setting up barriers to adoption. We receive $200,000/year from physicians and this is growing.</td>
<td><strong>Nursing Homes</strong> -- Fee of $300/month per facility.</td>
</tr>
<tr>
<td><strong>Obtaining Agreement on Fee Structure</strong></td>
<td><strong>Payers</strong> -- While Humana is on the Board, they are not participating financially. However, they are looking for ways to do so. We are doing our first project with Aetna for assisted care. They will pay for services if they see measurable improvement in reducing costs. We plan on participating in an Accountable Care Organization, and we believe that the payers will want to be financial participants.</td>
</tr>
<tr>
<td>Initial fee structure was established when HealthBridge was launched over 10-12 years ago. This was a complex negotiation among health systems. Our situation is very different today now that nearly every provider is on HealthBridge. A provider has to join HealthBridge to remain viable in the medical community.</td>
<td><strong>Approach to Fees</strong></td>
</tr>
<tr>
<td><strong>Benefits and ROI</strong></td>
<td><strong>Hospital Benefits</strong> 1) Hospitals do not have to establish separate connections for physicians to log on to hospital information systems; and 2) hospitals do not have to develop and maintain interfaces from hospital to physician office.</td>
</tr>
<tr>
<td><strong>Physician Benefits</strong> 1) Efficiencies and quality of care improvements for physicians include faster delivery of results allowing for quicker attention to patient problems; 2) less time spent by staff looking for results enabling lower administrative costs; and 3) fewer missed results meaning fewer medical errors.</td>
<td><strong>ROI for results delivery</strong> -- In 2000, the average cost to the hospital to deliver a result was $0.75. In 2007, the average cost was down by $0.63 to $0.12. This resulted in a total cost reduction for 2007 for 26 million results of $16.4 million. Based on current annual volume of 36 million results, the annual savings system wide to the community is $22.7 million or $1.9 million monthly. These figures do not factor in inflation, physician office efficiencies, or quality of care improvements.</td>
</tr>
<tr>
<td><strong>ROI for physician EMR Feeds</strong> -- There are over 1,000 EMR physicians and 250 EMR feeds in HealthBridge. System-wide savings are $1.3 million in cost avoidance of EMR interface fee and annual maintenance of $225,000. Assumes $5,000 interface fees and 18% maintenance.</td>
<td><strong>Payers</strong> -- While Humana is on the Board, they are not participating financially. However, they are looking for ways to do so. We are doing our first project with Aetna for assisted care. They will pay for services if they see measurable improvement in reducing costs. We plan on participating in an Accountable Care Organization, and we believe that the payers will want to be financial participants.</td>
</tr>
<tr>
<td><strong>HIE Participation</strong></td>
<td><strong>Physicians</strong></td>
</tr>
<tr>
<td>Greater Cincinnati has 5,500 physicians on its systems which represents 95% of physicians. The majority of physicians are on HealthBridge's EMR Light and 1,000 physicians use independent EMRs with data feeds. A very small percentage receive fax or print results and reports. Physicians have been essential to the growth of HealthBridge by recruiting other physicians, hospitals and other providers to participate.</td>
<td></td>
</tr>
</tbody>
</table>
## HealthBridge (HB)

### Interview Summary

<table>
<thead>
<tr>
<th><strong>Medicaid</strong></th>
<th>Medicaid -- we aren't working with the MMIS vendors.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public Health</strong></td>
<td>The Health Commissioner for Hamilton County is represented on our Board. HealthBridge does electronic disease reporting and public health alerts for them.</td>
</tr>
<tr>
<td><strong>IDNs and Pay</strong></td>
<td>IDNs' -- We work with them today. IDNs pay more than other providers in the aggregate.</td>
</tr>
<tr>
<td><strong>Incentives</strong></td>
<td>HealthBridge is part of a Patient-centered Medical Home (PCMH) pilot; we do the eRX 2% Medicare reimbursement; and part of Beacon calls for employers to develop a model for shared savings across all of the participants. It is about care quality and taking the PCMS as the standard for payment. HealthBridge is getting paid for participation; and the physicians are paying for the component that they use.</td>
</tr>
<tr>
<td><strong>Regional Extension Center (REC)</strong></td>
<td>HealthBridge has received a grant of $9.7 million to be the Tri-state REC.</td>
</tr>
<tr>
<td><strong>National Health Information Network (NHIN)</strong></td>
<td>HealthBridge is part of the NHIN Continuity Assessment Record and Evaluation (CARE). It was recently invited to join the NHIN limited production exchange with a small number of other operational HIEs. We are on-boarding onto the NHIN to interconnect with other HIEs. We have been invited to be on the NHIN Board.</td>
</tr>
<tr>
<td><strong>Rural Areas</strong></td>
<td>We have engaged rural areas through our outsourced HIEs in Indiana, Ohio, and Kentucky.</td>
</tr>
<tr>
<td><strong>Telehealth</strong></td>
<td>We are involved some. The Cincinnati Stroke Team logs into HealthBridge as the conduit of images. We have 12 PACs images online.</td>
</tr>
<tr>
<td><strong>Labs and Radiology</strong></td>
<td>All labs in the region are participating in HealthBridge. They need to participate because their customers use HealthBridge. The same is true for radiology. It is a market based decision. Once physicians have information in an HIE, they don't want to have systems that are different. They want information presented one way. The physicians went to the labs, radiology centers, and transcription centers and said: &quot;This is how we want to get our info&quot;.</td>
</tr>
<tr>
<td><strong>Social Security Administration (SSA)</strong></td>
<td>HealthBridge is one of 15 HIEs that were awarded a contract with the SSA.</td>
</tr>
<tr>
<td><strong>Other Income</strong></td>
<td>Nothing major</td>
</tr>
</tbody>
</table>

### Interviewee and Sources

**Interviewee:** Keith Hepp, VP of Business Development, HealthBridge in September 2010

**Source:**

Indiana Health Information Exchange (IHIE)

Interview Summary

What Makes IHIE Unique

IHIE has been highly successful at extending its services to new organizations and geographies to achieve economies of scale while building on the health informatics expertise of its partner, Regenstrief Institute. In addition, the two-year old Quality Health First® Program is the first HIE based quality and pay for performance program in the country. It combines claims and clinical data to supply physicians with reports on quality measures and electronic tools for patient chronic disease management.

Background

<table>
<thead>
<tr>
<th>Year Started</th>
<th>2004</th>
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</thead>
<tbody>
<tr>
<td>Year Implemented</td>
<td>2004</td>
</tr>
</tbody>
</table>

Mission and Strategy

IHIE helps ensure health information is where it needs to be, when it needs to be there to improve care coordination and patient outcomes. By connecting hospitals, physician offices and other healthcare facilities, IHIE helps to improve care coordination and support the safest and highest quality patient care possible, while saving time and money. IHIE assembles information to help providers identify patients needing testing and follow-up care for chronic diseases.

Services

Clinical exchange, quality program

Geographic Reach and Headquarters

Geographic reach: Indiana, Northern Illinois and beyond; Headquarters: Indianapolis, Indiana

Governance Structure

A non-for-profit 501(c)(3) with a Board made up of stakeholders including five competing hospital systems, the nation’s largest health insurer, employers, physicians and public health officials along with other economic development, community and business organizations. Now nearly 70 hospitals and 19,000 physicians participate in the HIE.

Stakeholders

Founders include: Regenstrief Institute, Indiana University School of Medicine BioCrossroads, and a collection of the largest hospital systems in Indiana (Clarian, Community Health Network, St. Francis Hospital and Health Centers, St. Vincent Health, and Wishard Health Services. Other participants include WellPoint, United Healthcare and employer groups. Community participants include: Central Indiana Corporate Partnership, City of Indianapolis, Health & Hospital Corporation of Marion County, Indiana State Dept. of Health, Indiana State Medical Association, Indiana University School of Medicine, Indianapolis Medical Society, and the Marion County Health Dept.

Functionality

INPC --- physician access to patient information; clinical messaging; Quality Health First – program to improve chronic disease care; and public health emergency surveillance system.

Technology

Internally developed through Regenstrief Institute

Participants

19,000 physicians, close to 20 hospital systems representing nearly 70 hospitals.

Volume of Activity

10.3 million patients and 2.8 million transactions per day (INPC)

Other Background

IHIE is active with national initiatives: Received a $16.01 million Beacon Community grant; part of the NHIN network for biosurveillance and Continuity Assessment Record & Evaluation (CARE) through Regenstrief Institute; MS C-HIEP Project on reporting de-identified quality assessment data to CMS; 8/10: pilot with VA to securely exchange electronic health data via the Nationwide Health Information Network; SSA disability processing contract.

The INPC now enables emergency medical technicians to transmit information to the Emergency Dept.

Five years ago, IHIE developed the Quality Health First Program, a unique program that helps physicians identify and prioritize necessary health screenings and other testing for their patients. The goal of the program is to ensure patients receive recommended preventive care and that their chronic diseases are being appropriately monitored and managed. The reports are used by payers in conjunction with their pay-for-value programs, aligning physician reimbursement to improvements in patient outcomes. It has been operational for 18-24 months.
## Indiana Health Information Exchange (IHIE)

### Interview Summary

#### Current Plans

IHIE has had rapid growth in the last year. As of September 2010, nearly 70 of 114 medical facilities in Indiana have signed contracts to exchange information via the INPC, and 25 of those are now up and running.

#### General

**Business Model**

IHIE provides services that can generate a profit and that leverage existing infrastructure. It pushes for continual growth to achieve economies of scale. Despite its size and participation in national activities, it relies on services to the local market for sustainability and avoids grants to cover operational costs.

**Current Issues and How to Address Them**

Trust is a major issue among stakeholders and participants. There needs to be good communication so that everyone knows the plans and what IHIE is trying to accomplish.

We had early successes for the stakeholders. Now they want to know what we have done lately!

**Meaningful Use Impact**

IHIE is committed to supporting the use of EHRs to at least 60 percent of all primary care providers within the Beacon region by 2013 to improve the quality of care. It plans to work with Purdue’s I-HITECH to support this effort.

#### Financial

**HIE Start-up Costs**

Initial investments were from Biocrossroads as well as partial prepayment of clinical messaging fees from charter hospitals.

**Annual Costs**

Estimated 2010 revenue $7.5 million; 2011 estimated revenue of $12.5 million

**Fee Structure for Data Exchange**

- **Data senders** -- $0.17 - $0.37 per transaction fee for distribution of results by labs (clinical messaging, volume-based sliding scale); no fees for clinician access to data
- **Physicians** -- no charge for clinical messaging or access to patient information (INPC)

We are migrating to a flat fee from a transaction-based mode in 2011. We will also incorporate repository services.

We are the process of transitioning from a transaction model to a flat fee pay for service model. It will also incorporate access to INPC, which was formally available through grant funding.

**Fee Structure Quality Health First Program**

- **Payers** -- originally was $0.30 per member per month but has dropped as we add more payers.
- **Physicians** -- no charge for participation.

**Obtaining Agreement on Fee Structure**

Clinical messaging was cash positive early on and a win for the hospitals. We continue to add services to amortize the cost of the whole infrastructure across multiple services to whomever benefits.

**Benefits and ROI**

There is a large ROI for clinical messaging which we have been able to validate. The savings were greater than initially projected.

#### HIE Participation

**Physicians**

IHIE focuses on services that are easy for physicians to adopt and doesn't charge fees to eliminate barriers to adoption.

**Medicaid**

Participates in the Quality Health First Program

**Public Health**

IHIE has a strong relationship with the Indiana State Department of Health and the Marion County Health Dept. Key data exchange includes: primary complaint for public health surveillance system.

**Incentives (Quality Health First Program)**

For the last 18-24 months, IHIE has been operating Quality Health First Program, a unique HIE program that provides physicians with meaningful financial incentives from participating health insurers and eliminates the need for separate insurer performance reports. Physicians receive monthly summaries to help physicians track their patients with chronic illnesses. It provides physicians with reminders for screening interventions, highlights disease specific follow-up care and patient specific disease-based summaries and provides physicians with both claims and clinical data. Currently, 5 health plans and close to 1,400 physicians are participating.
## Interview Summary

Quality Health First Program combines both claims and clinical data flowing through the HIE. IHIE becomes an independent aggregator supplying the physicians with reports on quality measures. IHIE contracts with payers who send the claims data. Anthem and United are participating. Medicaid and Medicare are participating with data. CMS is participating through the CMS 646 demo project. CMS and HHS are interested in further discussions. This program is spreading across the state and IHIE is in discussion with other payers.

<table>
<thead>
<tr>
<th>Regional Extension Center (REC)</th>
<th>IHIE works closely with the REC.</th>
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</thead>
<tbody>
<tr>
<td>National Health Information Network (NHIN)</td>
<td>IHIE is part of the NHIN Continuity Assessment Record &amp; Evaluation (CARE) along with Regenstrief Institute.</td>
</tr>
<tr>
<td>Social Security Administration (SSA)</td>
<td>IHIE is piloting with the SSA disability project.</td>
</tr>
</tbody>
</table>

### Interviewee and Sources

**Interviewee:** Tom Penno, Chief Operating Office, IHIE in September 2010

**Sources:**


### Inland Northwest Health Services (INHS)

#### Interview Summary

**What Makes INHS Unique**

Inland Northwest Health Services (INHS) continuously focuses on developing services that meet the needs of the communities that it serves, including the provider community. It continues to focus on increasing physician adoption and driving down costs to providers (and ultimately patients) through shared services while continuously innovating better and more efficient ways to do things. INHS is able to bring the same high quality and efficiency standards to the rural areas by providing them the same integrated information system, other data exchange options, widespread use of telemedicine, an air ambulance program and other vital health care services.

#### Background

**Year Started**

1994 – The INHS organization was formed more than 16 years ago when two competing hospital systems formed an organization to reduce rapidly spiraling health care costs and, at the same time, increase the quality of patient care.

As a stand-alone non-profit 501(c)(3) organization, INHS delivers on a founding mission — bringing high-quality, cost-effective health care to the region through innovative and successful collaborations of health care services.

**Year HIE Implemented**

1996

**Mission and Strategy**

INHS is focused on improving patient care through innovative technology solutions and shared services.

INHS manages one of the nation’s most advanced health information technology networks, committed to providing leading-edge services and technology that allow physicians and regional hospitals to share information, through rapid, secure access to patient records. This unique network streamlines the flow of patient information, saving money for communities, enabling physicians and clinicians to get better outcomes and lowering the cost of health care for patients.

**Services**

INHS oversees a variety of health care divisions and services that work together to improve outcomes, lead the way in health care innovation and create healthier communities. Below is a list of key services.

- St. Luke’s Rehabilitation Institute: Provides accredited inpatient and outpatient physical rehabilitation services as the state’s only freestanding rehabilitation hospital.
- Northwest MedStar: Provides safe, compassionate care and air transport of critically ill or injured patients to health care facilities throughout the Northwest.
- Community Health Education and Resources (CHER): Improves the health of the community through screenings, assessments, involvement and education.
- Northwest TeleHealth: Links the region to a variety of resources at over 100 locations through a robust telemedicine, video-conferencing network.
- health@work: A comprehensive health, wellness and productivity program providing innovative solutions to meet the individual needs of businesses - large and small.
- Health Training Network: Provides and coordinates medical training for health care professionals throughout the Inland Northwest.
- Northwest MedVan: Transports patients from their homes to medical appointments and back at no charge.
- Spokane MedDirect: Connects regional physicians and hospitals to local resources and services.
- Center of Occupation Health and Education (COHE): Works cooperatively in developing programs to improve the quality, cost effectiveness and consistency of care for injured workers.
- Performance Measurement System: A cost-effective way to consistently measure health care organizations’ performance, benchmark critical areas, identify and implement new processes.
- Information Resource Management (IRM): Sets the national standard in how health information technology improves a community’s patient care and lowers costs.
### Inland Northwest Health Services (INHS)

#### Interview Summary

The technology division of INHS provides a variety of shared IT services for providers and hospitals. An informatics solutions service provider, IRM provides high-quality consulting, implementation, management and outsourcing services to meet the technology and patient safety demands of the health care industry. Thousands of health care professionals in hospitals, clinics and physician offices can access their patients’ health records securely and quickly. Such integration ultimately lowers costs and improves patient care.

The shared services hospital systems implementation and support model focuses on quality standards and best practices designed to leverage staff expertise and efficiency:

- Customized strategy focused on patients, hospitals, physicians and staff
- Leverage internal assets with shared services
- More than 300 IT experts working to meet provider needs
- Local service model managed by an administrative director
- Network IT resources from desktop to systems analysts
- Centralized helpdesk to manage service requests

#### Geographic Reach and Primary Location

**Geographic Reach** -- 14 counties in three states -- Washington, Idaho, and Oregon; **Primary Location** -- Spokane, Washington

The network links rural and urban hospitals across the region through the integrated information system. This serves not only to strengthen the relationship between these facilities, but also to improve patient care by giving health care providers access to a common electronic medical record. Patients in the region often move between rural and urban facilities to receive care. With a common information system, physicians who are receiving patients due to a referral or an emergency can access the patients’ medical records from across the region, assuring that they have the most current information for making decisions about treatment.

#### Governance Structure

Inland Northwest Health Services (INHS) is non-profit regional collaboration. It has a five member executive team (CEO, CFO, CIO, etc.) with an eight member board of directors that represent member hospitals (including physicians) and community members. INHS operates a variety of health care services and also provides management and leadership for a critical access hospital.

#### Stakeholders

Member hospitals of INHS are Deaconess Medical Center, Providence Holy Family Hospital, Providence Sacred Heart Medical Center & Children’s Hospital and Valley Hospital and Medical Center. Advisors to INHS are Inland NW Community Health Project, City-wide Health Information Group and the Chamber of Commerce.

#### Functionality

INHS offers different mechanisms for data exchange: 1) integrated information system for hospitals and practices within the shared services network; 2) secure virtual private network for viewing hospital, lab and imaging data through a portal. In addition, there is secure wireless access to patient records via smartphones. In addition, INHS will soon have an HIE that uses a standardized data exchange process for providers outside the network.

*Telehealth* -- Northwest TeleHealth provides rural health care providers access to consultations with health care specialists through a robust video-conferencing network of more than 100 units throughout the northwest. This technology facilitates live, confidential interaction for two or more locations involved in patient consults, rural medicine, health education, medical training, business administration and other related activities. Northwest TeleHealth also engages in TeleER, linking rural emergency rooms with ER providers at larger urban hospitals in Spokane for consult.

#### Technology

INHS connects 38 hospitals and health care facilities that allow physicians and health care providers to securely access patient information utilizing wired and wireless technologies. INHS has a regional data repository, with standardized data and a common Master Patient index, which allows health care providers to access patient data through a secure web portal, download it wirelessly to a personal digital assistant or have the data transferred as a standard electronic message to their clinic’s electronic medical record system. Meditech is the primary hospital information system. GE Centricity is the primary health system EHR.

#### Participants

The integrated information system has over 38 hospitals and health care facilities, and includes more than 6,000 physicians as well as 450 clinics and offices. Over 1,000 physicians use...
Inland Northwest Health Services (INHS)

**Interview Summary**

- **Standardized Data Exchange**: Over 30,000 users view clinical data through the private network. There are hundreds of physicians in area hospitals with wireless access to patient records.

- **Volume of Activity**: There are over 3.5 million electronic records in the integrated information system. In 2009, Northwest TeleHealth bridged more than 1600 events (an increase of 24%) connecting more than 100 units throughout the region for events such as patient consults, tumor boards, TeleER, and support groups.

- **HIT/HIE Initiatives**: INHS is involved in many state-wide, multi-state, and national initiatives including the following:
  1. A state-sponsored health record bank pilot for patient view and sharing of health information;
  2. Awarded a $15.7 million Beacon Community grant for 14 counties in Washington and Idaho around diabetes management;
  3. Part of a 5-year CDC project to use a large-scale health surveillance network as an early-warning system for the spread of disease;
  4. Part of the Social Security Administration (SSA) disability claims processing integration;
  5. Launching a 2-year pilot with the VA and DoD to assist in developing the Virtual Lifetime Electronic Record (VLER) and simplifying data sharing using the INHS community HIE technology.

- **Other Background**: Three of INHS’-networked customers have achieved Stage 6 designation on the EMR Adoption Model (EMRAM). HIMSS Analytics developed the model as a methodology for evaluating the progress and impact of electronic medical record systems for hospitals. Tracking their progress in completing eight stages (0-7), hospitals can review the implementation and utilization of information technology applications with the intent of reaching Stage 7, which represents an advanced electronic patient record environment.

- **Business Model**: The model is based on standardization and establishment of shared services for 32 separate hospital IT support services and a shared repository. INHS has replaced physician practice services also. The providers pay INHS a monthly fee. The cost to participating hospitals is considerably less than they would pay if they tried to accomplish the same achievements on their own. The model is particularly effective for rural hospitals, which generally do not have sufficient resources to implement advanced information technology.

According to Tom Fritz, CEO: 12 years ago, INHS was able to validate that physicians were not using INHS’ non-integrated products. So, it started shared services in the community with five hospitals. The data center was originally only intended to serve these five hospitals. After a couple of years, doctors asked to meet with INHS, saying “We are impressed with the IT...”

Hospitals on the INHS network also are consistently ranked as the nation’s “Top 100 Most Wired” by Hospitals & Health Networks magazine.
### Interview Summary

Inland Northwest Health Services (INHS)

systems of the hospitals. We are in all 5 hospitals every day. We will tell you our stories.” There were horror stories. They asked INHS to work with them in running their IT system in a way that reduces costs and maintains the same up time as the hospitals. In that context, INHS brought the same services to the physician practices. Over time rural hospitals joined INHS, improving continuity of care throughout the region.

Today 300 employees support 45,000 users. This is a huge business, built on an organic process based on trust.

<table>
<thead>
<tr>
<th>Current Issues and How to Address Them</th>
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<tbody>
<tr>
<td>INHS’ major issues are vendor-specific issues. Issue is one of scalability. Can the vendors perform what we want to do especially around Meaningful Use? Can we move toward certified, interoperable products?</td>
</tr>
<tr>
<td>There is not a clear relationship between INHS and the state-level HIEs. INHS has an existing infrastructure, already larger than most state HIEs, and crosses multiple state lines. What does a state-level HIE bring INHS? What should the fee be when the services are not clear?</td>
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<table>
<thead>
<tr>
<th>Meaningful Use Impact</th>
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<tbody>
<tr>
<td>INHS’ goal is to help hospitals and physicians meet Meaningful Use. Three INHS networked hospitals are HIMSS level 6. There are only seven critical access hospitals in the country that have achieved that level, and two of them are part of the INHS network.</td>
</tr>
</tbody>
</table>

### Financial

<table>
<thead>
<tr>
<th>HIE Start-up Costs</th>
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</thead>
<tbody>
<tr>
<td>Initial investments were from two hospital systems.</td>
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<table>
<thead>
<tr>
<th>Annual Costs</th>
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<tbody>
<tr>
<td>Costs for hospitals range, based on the type and amount of service provided per facility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fee Structure</th>
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</thead>
<tbody>
<tr>
<td>Hospitals, physicians and other providers -- Fees are charged based on services received.</td>
</tr>
<tr>
<td>Health plans -- do not pay</td>
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</tbody>
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<thead>
<tr>
<th>Replicability of Model</th>
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<tbody>
<tr>
<td>Most people think this is not a replicable model, but it is. The model is based on organizations paying for services they receive and obtaining cost savings from shared services.</td>
</tr>
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</table>

### HIE Participation

<table>
<thead>
<tr>
<th>Physicians</th>
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<tbody>
<tr>
<td><em>Physician fees for the Integrated Information System</em> -- Charges for the ASP model is generally $350 to $500/mo. per doctor for a full support model. This compares to much higher capital costs for a full EMR when not using INHS. The HIE business model is evolving to meet the dynamic nature of our health care environment. We have learned that physicians are happy to pay for services when you offer them something they want and provide high-quality services that take the IT and infrastructure burden off their staff’s shoulders.</td>
</tr>
<tr>
<td>INHS supports 6,000 physicians that use the full EMR. There is 66% EMR adoption in Spokane County. It drops off in the rural regions, but is still quite high.</td>
</tr>
<tr>
<td>INHS has a monthly informatics meeting with 30 docs from the community, reference labs, and radiology. Our system has been developed by these doctors. They are our innovators and let other doctors know that they have upgraded and the benefits they have gained.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medicaid</th>
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</thead>
<tbody>
<tr>
<td>Medicaid is not a major payer in our market only representing 15% of our total business. Most of our business is Medicare. There is a lack of integration among state agencies, so a law was passed that a state agency could not be the state-level HIE.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Public Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>INHS works closely with the state public health departments for both Washington and Idaho.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>INHS has stayed away from incentive plans for the doctors. However, our mantra is patient safety. INHS was one of the first in the nation to implement bar scans on medications. Since then, INHS has focused on improving clinical outcomes and safety. INHS also is focused on quality reporting. INHS has a separate product on mandatory quality reporting that is available for our customers who need assistance in that area.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Health Plans</th>
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</thead>
<tbody>
<tr>
<td>INHS only has the ability to influence the health plans incorporated in our state. Larger health plans don’t want to do HIEs 150 different ways across the country.</td>
</tr>
</tbody>
</table>
## Inland Northwest Health Services (INHS)

### Interview Summary

| IDNs | There are a lot of IDNs that want to do exclusive business with INHS, especially in Seattle. Some have offered to pay to have a Board seat. INHS does not use these types of relationships. Our model is that we aren't exclusive; our focus is on the greater benefit to patients and the community. |
| Telehealth and Air Ambulance | TeleHealth, teleConsult, teleER and air ambulance are integral to what we are doing. INHS has 100 TeleHealth points of connection to hospitals, hospital districts, mental health districts, public health, prisons, tribes, VA, rural communities and more. INHS can bridge anywhere in the world and does so frequently with volunteer EMS groups throughout multiple states including Alaska. The first thing INHS does when implementing a hospital is to hook them up to telehealth for staff education. Not everyone has broadband, but it works. In addition, our air medical ambulance service, Northwest MedStar is serving the rural areas of the Northwest, providing critical care and transport for patients to larger medical centers for care. |
| Regional Extension Center (REC) | INHS is one of the five organizations in WIREC, a consortium of HIT adoption organizations. Quails (QIO) is the primary on this project. The REC is focused on connecting the rural physicians. |
| NHIN | INHS is represented on the NHIN Coordinating Council and recognizes that it is important that NHIN not duplicate other HIEs. There are two different issues. NHIN Direct and NHIN Connect. NHIN Direct is a low-end clinical messaging system. That won't be a solution for any HIE. It is intended to help a rural physician to transfer limited information on a particular patient. NHIN Connect is the only place to get federal data – SSA, CMS, DoD, VA and more. These data sources will flow through NHIN Connect. Medicaid data will flow through the state HIE. Not all of the communities need federal data, but for communities with military bases and/or a VA hospital, this is essential. |
| Labs and Radiology | Labs are complex to work with, and right now we can’t get their data. Reference labs such Quest and LabCorp don’t want to connect 500 different ways. We are trying to standardize, but that can be of concern to them. Both labs use single systems, and they will want us to make changes that increase our costs. Imaging is a little different. Because of the challenges with storing images, INHS utilizes a digital image “store”. People access products from the “store”. INHS pays the vendor to place the images in the store. |
| Social Security Administration (SSA) | INHS is currently implementing the SSA disability transaction processing right now and believes there is a lot of potential savings and improved patient payments from making transactions electronic. |
| Other Income | INHS hasn’t used federal or state funding for sustainability. CDC, SSA, and other federal programs are project-based and focused on specific deliverables. There is a need for an independent organization to validate Meaningful Use and other new concepts for providers to get incentives payments. That is a great opportunity for states. |

### Interviewee and Sources

**Interviewee:** Tom Fritz, CEO, Inland Northwest Health Services, September 2010. Tom has been CEO of INHS for 12 years.

**Sources:**

<table>
<thead>
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<td><strong>Interview Summary</strong></td>
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</table>

*Tom Fritz*, Center for Health Transformation,  
### MedVirginia

#### Interview Summary

**What Makes MedVirginia Unique**

MedVirginia is passionate about understanding the needs of the physicians and bringing value to them recognizing that their participation creates value for other key stakeholders, including data suppliers such as health systems. In addition, it understands the unique needs of each of its constituencies and makes sure the HIE brings value to each. Currently, it is building the capacity of MedVirginia to integrate into care management initiatives such as a patient centered medical home program and an accountable care organization.

#### Background

<table>
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<tr>
<th>Year Started</th>
<th>2000</th>
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<tr>
<td>Year Implemented</td>
<td>2006</td>
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**Mission and Strategy**

The mission of MedVirginia is to organize, coordinate and serve provider interests in health care information technology by providing a system for community-wide clinical information exchange that enables improved clinical workflow and the attainment of “meaningful use” of health IT. MedVirginia also helps providers utilize health IT to create and maintain patient-centered medical homes for those they serve.

#### Services

- Clinical exchange

#### Geographic Reach and Primary Location

- Geographic Reach: Richmond region, Hampton Roads, and Lynchburg
- Primary Location: Richmond, Virginia

#### Governance Structure

MedVirginia is a Virginia Limited Liability Company. The initial investors in MedVirginia are CenVaNet, a leading hospital and physician-owned network based in Richmond, VA, and MedAtlantic, an affiliate of the Virginia Urology Center. MedVirginia is governed by a 5-member Board of Managers.

Of the five board members, 4 are physicians and the fifth is the Regional CIO from Bon Secours Richmond Health System. There is a large multi-stakeholder advisory council.

The Advisory Council includes the VA, Dept. of Health, Virginia Academy of Family Physicians, SureScripts, universities, payers, local health planning agencies, and others. It also includes the Honorable Louis Sullivan who, under President George Bush, called for interoperability on a national scale.

#### Functionality

Clinical Health Information Exchange that delivers information via a secure web-based portal:
- Patient centric clinical data housed in a community repository
- Task list of results and messages
- Diagnostic test results
- Order entry capabilities
- Access to results from the VA and DoD via the NHIN
- Delivery of clinical data to the SSA via the NHIN
- Clinical consults and referrals
- Integration with practice management system, including integrated practice schedule
- Links (single sign-on) to hospitals for additional information
- Options for integrated e-Prescribing and electronic health records
- ePrescribing and prescription refill requests will be introduced with the EMR Light in the near future.
## MedVirginia

### Interview Summary

#### Technology

MedVirginia has a hybrid model with both a repository and a federated approach. The original vendor was Wellogic. While Wellogic was a good partner initially, we needed a scalable, more battle tested infrastructure. So, in 2010, MedVirginia became the first HIE client of Verizon HIE, a 'cloud' solution to facilitate sharing of patient information among health care providers. MEDfx brings portal and systems integration technology to Verizon’s HIE, and Oracle contributes enterprise master patient index software, a health transactions processing engine and data base systems. This provides us with a solid infrastructure and an innovative portal. We want to continue to be innovative about infrastructure. Verizon’s world class security services are another strong attribute of the new HIE infrastructure, and we believe strongly that security is an essential requirement for trust.

#### Participants

| 300 individual physicians and 15 regional hospitals including four hospitals in the Bon Secours Richmond Health System, the Hampton VA Medical Center, and Portsmouth Naval Hospital. |

#### Volume of Activity

| 1,000,000 unique patient charts |

#### Other Background

- Michael Mathews was named 2010 Health Advocate of the Year - Private Sector by eHI; he has led MedVirginia’s successful bid to participate in CMS Electronic Health Records (EHR) Demonstration. Michael also oversaw the clinical automation of Richmond-area free clinics utilizing grant funding. Over the last several years he has led MedVirginia’s participation in the NHIN. MedVirginia was the first HIE to go into production on the NHIN in its initiative with the Social Security Administration.

- MedVirginia is working with the DoD and VA to exchange patient information with Hampton Roads as part of its Virtual Lifetime Electronic Record (VLER) community project, and it became the first community-based HIE to exchange data with the DoD and VA in August 2010. Virginia is home to thousands of active duty military and veterans seeking healthcare among DoD, VA and private sector providers and is the second site of DoD’s joint project with the VA to share electronic records in a complex services environment. DoD can now share clinical results with the Bon Secours health system via MedVirginia.

- MedVirginia has expanded its partnership with the SSA in collaboration with Centra Health, a 3-hospital system based in Lynchburg. MedVirginia also is one of three HIEs participating in the C-HIEP project with CMS to standardize data reporting from long-term care providers.

- MedVirginia is a participant in NHIN including the NHIN limited production exchange. It was the first participant in the SSA claims pilot (first in country).

#### Current Plans

MedVirginia will introduce EMR Light and ePrescribing in the near future.

In 2011, our sister care management organization will provide incentive programs that access records through MedVirginia.

#### General

**Business Model**

MedVirginia is passionate about understanding the needs of the physicians and bringing value to them, recognizing that they create value for other stakeholders. In addition, it understands the unique needs of each of its stakeholders and makes sure the HIE brings different value to each. MedVirginia does not rely on grant funding for sustainability but makes use of it to meet the needs of stakeholders who would otherwise go un-served (e.g. free clinics).

**Current Issues and How to Address Them**

There are a lot of moving parts. We want to make sure that we bring value to local providers. If we initiate a project that brings value to Montana, but not the local provider, that is not good enough. We try to push a balance between the local and national providers.

There is a challenge moving to a new platform. That is a lot of effort.
## MedVirginia

### Interview Summary

There is a lot of policy work is at a state and federal level. We are not struggling with those issues. However, there is an excitement of participating in a meaningful way (such as with NHIN and SSA). The industry is finding its way. A lot of science projects and experiments have gone on. We have proven the value and many use cases. I see the biggest challenge for the industry is how we scale from interesting successes.

### Meaningful Use Impact

We work closely with hospitals to get their data to physicians enabling exchange. We will have a certified exchange EMR during the time frame of Meaningful Use.

We don’t want to get into competition with EMRs with our certified exchange EMR. On the other hand, if physicians want an alternative that can be built off of the HIE, we can provide it.

### Financial

#### HIE Start-up Costs

Started at $2 million originally

#### Annual Costs

Before Verizon and NHIN, our operating costs ran about $1.5M; since NHIN they have been closer to $5M (additional functionality query, SSA, federated model, open source Connect gateway)

The projected annual costs are confidential. However, we are confident that we are financially viable into the future. The Verizon platform works well for us to support an ever-expanding local base and NHIN connectivity support. Some of the development costs will taper off. Costs for existing business won’t go up. If it goes up, it will go up because of more business such as when we establish VA and DoD services, which is an expanded footprint.

### Fee Structure

**Basic Fee Structure:** Until NHIN came along, our fees in the basic business model were coming from data suppliers -- hospitals and labs. This is the core. I preach that.

Hospitals are paying for interfaces with their core clinical systems. Reference lab pays for the delivery of results to the ordering physician.

**Fee structure for hospitals and labs:** It is formula based -- number of systems, number of unique patient records, quality of the data, total number of physicians, and total number of messages.

**Physician Fees Pre-NHIN:** There was no charge to physicians for the basic view. In the future, we will start to charge for EMR Light. In the near future, additional services will be available on a subscription basis, including the EMR Light, ePrescribing, integration of practice notes and integration of practice management systems. The pricing model is not set yet.

**Payers Fee:** -- None at this point.

### Obtaining Agreement on Fee Structure

I am administrator and part revival circuit rider. We understand the needs of the wounded warrior and know our physicians. We understand what the clinics are facing. We are engaged with the safety net. There is no particular magic. In an HIE, it is about how to have a single utility bring different value to each of the stakeholders. So, far we have done that successfully. We have staff and partners who believe in this.

### Benefits and ROI

An ROI was done around the SSA study. That one study indicated that SSA data exchange more than pays for itself and more than pays for the data supplier fees. That whole project has not received the attention it deserves. Any health system could take this case study and model this out and justify the cost of participation even if the calculation is off by a magnitude of 2.

### HIE Participation

**Physicians**

Physicians create demand for the HIE. The HIE can move where there are opportunities (Hampton Road, VA, and DoD). Participation is compelling when results can bring benefit to such critical patient populations as our wounded warriors. It is the moral authority and imperative. Once technical capability has been demonstrated, then the conversation shifts from “can we?” To “how should we?”
MedVirginia

Interview Summary

One of the things we do is meet the physician where they are at -- not one size fits all. 1) There are a lot of technophobes. We need applications to bring them along. 2) We also need to feed discreet results to early adopters by feeding into the EMR and messaging. 3) The physicians in the middle of the bell shaped curve need a user friendly portal to find value without months of training. Speaking to use cases, rather than “the world is a beautiful place”, we need concrete value -- ER utilization, meds reconciliation for chronically ill, respond to needs of rural population, etc.

We have a 15-20% adoption rate in the Richmond area, which is consistent with the rest of the country. HIE adoption and use is expected to accelerate. This includes new types of transactions such as access to results, access to VA data, and exchange of SSA transactions. This would be followed by data exchange with other communities within the state. Increasingly, a lot of the activities will incorporate interfaces with physician EMRs

We don’t charge the physicians for the portal, but in the future, we will charge them for EMR Light. For the sake of sustainability, we don’t want to compete with the EMR vendor community. With the EMR Light, MedVirginia will accept whatever volume comes our way. MedVirginia will continue to be EMR agnostic, and will offer an EMR Light that offers value but not compete with the vendors.

We have been slow to engage the payer to ensure that we maintain the trust of the physicians. We can engage the payers more in the future.

Medicaid

We have been involved with the state’s HIE planning and have worked closely with Medicaid folks. There are possibilities for intersection, but I am not seeing it yet because there is more to be sorted out on the overall HIE vision in Virginia. The state is establishing a state-level HIE. In that environment, what is Medicaid? A node? A user? A data supplier? Questions are out there that haven’t been answered yet.

IDNs

There are issues with IDNs that will take sorting out. I have used the term “enlightened IDNs” to describe a sponsor that doesn’t wait 15 years for other people sitting around to do something. A leader will move forward and bring value to the doctors. Will the IDN move past the core beliefs that they are competitive? If so and if the IDN can demonstrate that physicians can do business with the IDN, then that is the way the world will work. The physicians create the sense of urgency.

Health Plans

MedVirginia will engage the health plans through the patient centered medical home and accountable care organization. We are not just an HIE. This is where our sister care management organization kicks in strong for us. Meaningful Use and medical home are two sides of the same coin. Our care management organization is working with the health plans. That is where I get excited. We have plans for an Accountable Care Organization (ACO) in 2011. That is where we have alignment of incentives. The care management organization functioned as a risk bearing PHO in the 1990s.

Health plans don’t have as many sandboxes to play in as the HIE. Can they work on an ACO themselves? An HIE can get the agreements with stakeholders by understanding the value proposition to the stakeholders to meet their missions.

Rural Areas

Rural providers must not be forgotten in HIE, even though some challenges, such as lack of broadband availability, can be even greater in these regions.

Incentives

We don’t currently have an incentive program. However, within the next six months, our sister care management organization will provide incentive programs that access records through MedVirginia. The care management organization has 80% ownership of MedVirginia.

Risk Purchasing Group -- our sister care management organization has worked out a partnership with a medical malpractice insurance liability company. If the care management organization has credentialed a physician and the physician uses MedVirginia, then the care management group gets 20-30% savings for liability insurance for our participating practices. This brings additional value back to the physicians.
### MedVirginia

#### Interview Summary

<table>
<thead>
<tr>
<th>Regional Extension Center (REC)</th>
<th>We work with the REC here. I sit on their advisory council. We work close with the state, medical society, and the hospitals we can support.</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Health Information Network (NHIN)</td>
<td>MedVirginia was the first HIE to be live on the Nationwide Health Information Network (NHIN). Michael Mathews is Chair of the Coordinating Committee of NHIN Exchange.</td>
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<tr>
<td><strong>NHIN exchange vs. NHIN direct.</strong> NHIN Exchange is a set of standards, services and policies that enable secure health information exchange over the Internet. A group of federal agencies; local, regional and state-level Health Information Exchange Organizations (HIOs); and integrated delivery networks are demonstrating exchange. Federal agencies will be exchanging data with other organizations through NHIN Exchange. NHIN Direct, on the other hand, is a secure mechanism to exchange a clinical data summary. This is a very basic tool for small providers without access to other HIEs.</td>
<td></td>
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<tr>
<td>NHIN Exchange can be a concern for a state HIE if a large health system can access the NHIN Exchange directly. It is a basic ROI analysis. What is the cost of accessing NHIN directly vs. through the state-level HIE? The local organization has to be convinced to access NHIN through the state-level HIE.</td>
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<tr>
<td>What is the role of NHIN Direct for vendors and users? We will want to monitor this from a policy framework perspective. NHIN Direct takes on the responsibility of identity management and authentication. The vendors will not do that in the way that an IDN or state will do it. From a national perspective, the feds have to scale the HIE nationally. I am open to seeing where NHIN Direct will go. Interoperability with federal agencies will be critical, which can be done through both NHIN Exchange and NHIN Direct.</td>
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<tr>
<td><strong>Telehealth</strong></td>
<td>There is a lot to be sorted out between HIE and with broadband, telehealth, and telemedicine. I have worked with Dr. Karen Rheuban, Director of Telemedicine at UVA. We looked at the intersection of telehealth and HIE. The basic message is that telemedicine feeds without access to the medical chart is not enough. We see telehealth and HIE running parallel right now. The other area of anticipated development is home-based monitoring. How can we get these to work together?</td>
</tr>
<tr>
<td><strong>Labs</strong></td>
<td>Hospitals not wanting the independent labs to participate have not been an issue. However, the reference labs are not all that interested in working with the HIE. They prefer to work directly with the physicians. At this point, we are not as effective at working with the labs as we could be.</td>
</tr>
<tr>
<td><strong>Social Security Administration (SSA)</strong></td>
<td>MedVirginia was the original SSA pilot starting in February 2009. The intent was to create a system that lets providers electronically submit health records supporting an applicant’s claim for SSA disability benefits. In February 2010, 15 additional contracts were awarded, including one to MedVirginia to expand the number of health systems participating. This is a great deal for HIEs because there is enough ROI to sustain an HIE.</td>
</tr>
<tr>
<td><strong>Results of SSA study:</strong> The exchange reduced by almost half the processing time for a disability determination from 84 days to 46 days. The SSA study suggests that the pilot generated an additional $2 million in revenues annually for the providers involved. The increased speed for making determinations resulted, in many cases, in more disability income that provided additional revenue to health plans, hospitals, and other care providers using the health exchange. This is revenue that the facility would not necessarily collect otherwise.</td>
<td></td>
</tr>
<tr>
<td><strong>Other Sources</strong></td>
<td>We are not opposed to grants, but we don’t rely on soft money to sustain operations. We got a grant from the state for the clinics, but we don’t use this money for core operations.</td>
</tr>
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#### Interviewee and Sources

**Interviewee:** Michael Mathews, CEO, MedVirginia, in September 2010

**Sources:**

### MedVirginia

**Interview Summary**

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<thead>
<tr>
<th>Title</th>
<th>Source</th>
<th>Date Accessed</th>
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MiHIN Resource Services (MiHIN)

Interview Summary

What Makes MiHIN Resource Services Unique

In 2006, Michigan developed an HIE strategy to organize regional HIEs around Medical Trading Areas. This triggered HIE planning and formation at the health system, community, regional, and cross-regional levels. Since then, Michigan stakeholders have had several years of experience reconciling how these HIEs connect to each other. MiHIN Resource Services reflects that consensus. It serves its primary customers -- sub-state HIEs, payers, and the State of Michigan -- to exchange data between these customers rather than providing services directly to the user organizations. This reflects the belief by stakeholders in Michigan that each region of the state is different and that the sub-state HIEs are in the best position to serve the local needs.

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<td><strong>Mission and Strategy</strong></td>
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<td><strong>Services</strong></td>
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<td><strong>Geographic Reach</strong></td>
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<td><strong>Governance Structure</strong></td>
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<td><strong>Stakeholders</strong></td>
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<td><strong>Functionality</strong></td>
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</table>
**MiHIN Resource Services (MiHIN)**

### Interview Summary

#### Technology

The suite of services includes state level directories such as a master citizen index, master provider index, and a record locator service. The technology will be based on a design that enables widespread interoperability among disparate healthcare systems; is vendor and technology agnostic; and focuses on technical standards, protocols and architectural patterns. The technology is based on a service oriented architecture paradigm and will be implemented through Web Services executing on an Enterprise Service Bus (ESB).

#### Participants

Operational sub-state HIEs include: Capital Area RHIO, Upper Peninsula Health Care Network, MSMS Connect (portal available through Michigan State Medical Society), and Michiana Health Information Network in South Bend, Indiana. Others to be connected to MiHIN include Michigan Connect (West); Jackson Community Medical Records, and SEMHIE Beacon Community. MiHIA in central MI may join another sub-HIE rather than MiHIN.

#### Volume of Activity

Seven sub-state HIEs will be implemented over 18 months.

#### Other Background

In 2006, Michigan did pioneering work in establishing nine "medical trading areas" that cover all counties in the state in which HIEs would be developed. Michigan Dept. of Health used $10 million in funding appropriated from state general fund dollars to sponsor one HIE initiative within each of the nine medical trading areas. This has resulted in a plethora of HIE activity in various stages of planning, commitment, and implementation and the need for the MiHIN Shared Services HIE infrastructure to share data across sub-state HIEs.

South East Michigan HIE (SEMHIE) is coordinating the $16.2 million Beacon Communities Grant focused on improving diabetic care.

In September 2010, SEMHIE received a $3 million grant from SSA to accelerate the disability claims process using the NHIN.

#### Current Plans

Our implementation timeline hinges on approval by ONC. We ballpark it will take six months to get started on the technology. We also have to have governance determined and the procurement process at the point where the technology will be deployed. We will implement 7 HIEs over 18 mos.

#### General

**Business Model**

To ensure long-term sustainability, MiHIN has adopted a sustainability funding mechanism that is built upon serving its primary customers for the Shared Services Bus -- sub-state HIEs, the State of Michigan, and payers -- and empowering them to play an active role in governance and finance.

**Current Issues and How to Address Them**

The issues that drove us to the current governance and technology model is that there is a strong need in Michigan to have local flavor -- what works for one community doesn't work in another. Our planning process was, at times, ugly. It is hard to get issues on the table. It was clear that nobody, even the technology people, thought a state-wide HIE will work in Michigan for technology, political, governance, and financial sustainability reasons. We are relying on the up and coming sub-state initiatives around the state for lab results delivery and summary documents. They are just now taking off. We will do whatever we can at a policy level to make sure the providers have at least one HIE option. Already, our providers have one option or more available to them.

One of our biggest issues is using the ONC funding to support and nurture the regional HIEs but still accomplishes the original goal of state-wide connectivity as defined by ONC.

**Meaningful Use Impact**

One of the factors in ranking of the HIE Service Priorities is based on whether the service supported the proposed Meaningful use criteria in 2011. The state has a very robust immunization registry, and our providers want to it to be operational with their EMRs. We have been in discussions with ONC about this. They have asked us to reprioritize to help providers achieve Stage 1 Meaningful Use. This could put the immunization registry at a lower priority.

**Financial**

**HIE Start-up Costs**

Original funding was $10 million in 2006 through the state to launch HIE planning in medical trading areas (MTAs). This resulted in state planning awards in 2007 to five MTAs and planning grants to two MTAs. Michigan Dept. of Health was awarded nearly $15 million in 2010 by the Office of National Coordinator to establish the state-level HIE, plus another $6.6 million from a State of Michigan.
**MiHIN Resource Services (MiHIN)**

## Interview Summary

### Annual Costs

The ball park annual costs are less than $2 million for technology and administration. Costs will go up beyond Stage 1 if we add registry and translation services.

### Fee Structure

The fees structure hasn’t been decided yet. It will be decided by the Board including sub-state HIEs, Public Health, Medicaid, and payers. The basic approach is that those who connect will pay, and those who pay will have a seat on the Board. This approach is less about the money and more about the desire of sub-state HIEs to influence how the state-level HIE is run.

**Private payers** -- We are still working on this with the payers. We left 3 seats on the Board for BCBS and two other payers. We want to make sure they are included, but they have struggled with how to participate. They want to control health care costs. Payers can invest just one time at the state level but not all health plans have a state-wide presence so they are not all inclined to do that. There is one health plan in Western Michigan, one in Eastern Michigan, BCBS, and Medicaid.

**Government payers** -- Medicaid is doing an HIE on a pilot basis in the Capital Area. They are paying Capital Area RHIO $0.25 per member per month. Medicaid has a great chance to go across the state with the EHR incentive funding. The Michigan State Office is also funding the Capital Area RHIO for employees and retirees at $0.25 per member per month. The bulk of their employees are in the Capital Area. As a result, the State Office is not likely to fund sub-HIEs across the state.

### Obtaining Funding Agreement

This has been a slow, multi-year, process and, at times, difficult.

### HIE Participation

#### Physicians

MiHIN does not have a direct contract with the physicians.

#### Medicaid

Medicaid has been a great partner. There are many ways that Medicaid can benefit from the connection of the sub-state HIEs to MiHIN including replacing Medicaid’s paper system to populate the CCD into the claims-based Medicaid health record.

On a pilot basis, Medicaid is paying Capital Area RHIO at a rate of $0.25 per member per month. We are working with MITA and Medicaid to establish a master patient index. We see Medicaid as like a sub-state HIE and are exploring the use of MITA funding for MiHIN.

#### Public Health

Michigan has a robust public health system. Over 6.5 million citizens out of 10 million are in the immunization registry. Public health benefits from MiHIN including: 1) a care improvement registry (population management); 2) state labs for data exchange and reportable conditions; 3) disease surveillance system, which will be able to receive lab results; and 4) the syndromic surveillance system, which can receive diagnoses and chief complaints from the emergency departments.

We do not envision charging public health a fee. Reporting is mandatory. The fees have been overlooked because the State of Michigan put up the match dollars for sub-state HIEs. This approach is subject to change.

#### Health Plans

Part of the business model is getting the investment from the health plans. Health plans can invest anywhere in the chain -- sub-state HIEs or MiHIN. Sub-state HIEs will want to show value to insurers.

#### IDNs

We are encouraging them to participate in a sub-state HIE. If they believe that they have the technology in place and the ability to participate financially in MiHIN directly, then we would treat them like a sub-state HIE. We had a large IDN that discovered that it was cheaper and easier to connect to a sub-state HIE than to connect to MiHIN directly.

#### Regional Extension Center (REC)

The REC works closely with Medicaid. They are the Medicaid partner to get word out about the incentive plan. This is important because providers connect directly to sub-state HIE.

#### National Health Information Network (NHIN)

We are in a wait and see mode until it is clear the direction that ONC is taking. Our stakeholders who are further removed from ONC are not clear what to do. Now that SEMHIE has obtained the SSA grant, ONC is more focused on connecting SEMHIE and other SSA grantees on the NHIN than MiHIN.

#### Rural Areas

Michigan has many rural areas. The sub-state HIEs are able to address their issues.
MiHIN Resource Services (MiHIN)

Interview Summary

<table>
<thead>
<tr>
<th>Incentives</th>
<th>Supporting sub-state HIEs for quality reporting is one of the priorities.</th>
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<tbody>
<tr>
<td>Telehealth</td>
<td>We have some big telehealth networks already. We have been regarding each other cautiously. We need to come together and look for overlap. There is a strong presence in the Upper Peninsula where there is inclement weather and the elderly. They do surgery follow-up via teleconsulting with University of Michigan. Southwest Michigan also uses telehealth.</td>
</tr>
<tr>
<td>Labs</td>
<td>We want the option to do this at the state-level. This can be viewed by sub-state HIEs as taking competitive advantage away from them. So, this is an issue.</td>
</tr>
<tr>
<td>Social Security Administration (SSA)</td>
<td>SEMHIE has received the SSA grant to implement disability claims processing. We are letting SEMHIE do its pilot. We will later figure out how to make it available for the state. Who this belongs to is yet to be determined.</td>
</tr>
</tbody>
</table>

Interviewee and Sources

**Interviewee:** Beth Nagel, HIT Coordinator, MiHIN in September 2010

**Sources:**

**Minnesota Health Information Exchange (MN HIE)**

### Interview Summary

#### What Makes MN HIE Unique

The state of Minnesota is unique compared to other states because it has very large integrated networks with a very high percentage of employed and contracted physicians in the state rather than independent physicians. Three year start-up funding for MN HIE came from six sponsor organizations -- two health systems, three payers, and the state, and together they were able to build the scalable infrastructure and provide patient data for the HIE covering 84% of the residents in the state. A pricing strategy for utilizing the HIE includes many stakeholder groups -- clinics and large care systems, hospitals, long-term care, public health agencies and school districts. The bulk of the fee income will come from large care systems. The task at hand is now physician adoption.

### Background

<table>
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<tr>
<th>What</th>
<th>Value</th>
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<tr>
<td>Year Started</td>
<td>2007</td>
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<tr>
<td>Year Implemented</td>
<td>2008</td>
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#### Mission and Strategy

**What is MN HIE**: State-wide secure network and record locator service designed to share clinical and administrative information among healthcare providers in Minnesota and bordering states.  
**Purpose**: Improve the health of all Minnesotans through more informed decision making by the provider and patient at the point of care.  
**Goals**: 1) Support interoperability across Minnesota, 2) Enhance safety, quality and reduce healthcare costs; and 3) Establish an economically sustainable business.  
**Patient Controlled**: 1) Consent at each visit; and 2) Ability to opt-out of clinical information exchange.  
**Key Principles**: Patient controlled and patient centered, provides connectivity for all health care organizations, meets providers "where they are", and provides aggregated patient specific data.

#### Services

Clinical exchange along with some administrative functions

#### Geographic Reach

Minnesota and bordering states of Wisconsin, Iowa, North Dakota, and South Dakota

#### Governance Structure

MN HIE is a not-for-profit company with a public/private governance model including providers, health plans, and Minnesota state government. MN HIE is the state-level HIE.

#### Stakeholders

Founding Members -- Health Systems: Fairview Health Services and HealthPartners; Health Plans: BCBS of Minnesota, UCare and Medica; and State Govt.: MN Dept. of Human Services.

#### Functionality

**Current** -- Data: medication history (claims data), immunizations, and lab history; ability to exchange clinical information (Continuity of Care Document); and ePrescribing. Key patient functions: consent management and opt-out capabilities.  
**Future** -- functions on the Roadmap to Meaningful Use.

Three ways to access the administrative and clinical data: 1) stand-alone web-browser; 2) embedded into an electronic medical record; and 3) interoperable transactions.

#### Technology

Federated environment, centralized secure patient directory (SPD), centralized record locator service, role based security. Vendor is Covisint, a health care sub of Compuware.

#### Participants

There are 4.2 million Minnesota residents out of 5 million residents in the state in the secure patient directory. This includes most patients that are insured through HealthPartners, BCBS of Minnesota, UCare, Medica, and MN Dept. of Human Services. Medicare patients are not currently included except for 328,000 individuals covered by a Medicare insurance product offered by a health plans.

#### Volume of Activity

Our first implementation is going on right now -- a specialty group (90 physicians) and Fairview Health Services.

#### Other Background

State Regulation mandates administrative simplification for providers and health plans in 2009, e-prescribing in 2011 and interoperable EHRs in 2015. MN HIE strategy is to provide an infrastructure base to support Meaningful Use and other applications /services as needed in the market.
# Minnesota Health Information Exchange (MN HIE)

## Interview Summary

In 2010, the state legislature required certification of HIOs and HDIs by the Dept. of Health. HIOs must be not-for-profit in nature, be certified by the state, gain accreditation from EHNAC's new program for health information exchanges and commit to supporting all clinical based Meaningful Use requirements. HDIs may be for-profit in nature with less stringent requirements. HDIs are typically focused on specific clinical domains in healthcare. An example of a potential HDI would be SureScripts.

MN HIE is included in the Beacon Grant of $12.3 million awarded to Mayo Clinic to enhance patient care coordination, reduce hospitalization and emergency room costs for diabetes and childhood asthma, and address health disparities for underserved and rural populations.

### Current Plans

The Minnesota Health Information Exchange (MN HIE) is conducting a pilot project with Aging Services of Minnesota at 12 of their member settings. This select group of care centers and assisted-living providers will use MN HIE's stand alone web services to view long term care patient's clinical information.

### General

#### Business Model

Start-up funding came from six sponsor organizations -- two health systems, three payers, and the state, and together they were able to build the base infrastructure, and provide patient data for the HIE covering 84% of the residents in the state. A pricing strategy for utilizing the HIE includes clinics and large care systems, hospitals, long-term care, public health agencies and school districts. The bulk of the fee income will come from large care systems. The current priority is to establish the exchange of patient clinical summaries (CCD) with Fairview Health Services, scheduled for November 2010 and then to extend and accelerate physician adoption.

#### Current Issues and How to Address Them

- **Scale-up and Sustainability** -- We have accomplished a lot -- governance, initial funding, and a technology platform that is scalable and can support Meaningful Use. To achieve a sustainable model, we need to now focus on adoption.

- **Lessons learned** -- Privacy and security need to be addressed up front; data sharing is a cultural challenge; adoption is a slow process; and on-boarding and training are critical to success.

- **Opt In** -- This state passed a law that if you have an HIE, the default rule is that you run with an opt in model. Patients give consent at each visit. We are working on privacy issues right now.

- **Opt Out** -- A patient in our Master Patient Index (MPI) can decide to opt out. They can call our 1-800 number or request assistance from their providers. MN HIE has the ability to disconnect the Record Locator Service from the clinical information. We require a written authorization for consent at least once a year. The providers have added another signature block and providers ask for oral consent after that. The system prompts the provider about consent.

- **Physician Adoption** -- The big issue is physician adoption. We have info useful to them on med history, etc. Interest has increased in the last six months. Overtime, Meaningful Use will make this a more urgent matter. However, in Stage 1, there is not a lot of requirements to use an HIE; just conduct a test. Also, some practices want to work with us, but are still waiting for an EMR upgrade.

#### Meaningful Use Impact

MN HIE will meet Stage 1 requirements for data exchange. Future plans are to develop functions that are on the Road Map to Meaningful Use.

## Financial

### HIE Start-up Costs

Start-up funding came from our six sponsor organizations. They made a commitment to a ceiling of money. We issue interim capital calls. It spans 3 years and we're two years into it. We have the base infrastructure in place. We feel good about the approach. It's all about adoption at this point.

All partners are equal payers including funding, rights, and responsibilities. There is parity across the board. If someone wants to invest more dollars, they won't have additional influence.

### Annual Costs

We expect this to be a $6 million operation.
**Minnesota Health Information Exchange (MN HIE)**

### Interview Summary

#### Fee Structure

**Clinics and Large Care Systems** -- There is a standardized monthly subscription fee scaled by number of providers. The base fee is $60/mo. per provider FTE for a 1-200 provider organization down to $50/mo. per provider FTE for up to 829 providers. For organizations with 830 provider FTEs or more, the fee is capped at $500,000 per year. A provider FTE includes MD, PA, DO, DDS, OD, DPM, and DC.

**Hospitals (using community providers), long-term care, public health agencies, and school districts** -- Alternative fee structures have been established for each category. Representative annual fee ranges: hospitals with community providers with less than 100 beds ($1400 - $5000); higher fees for hospitals with more than 100 beds; long-term care ($600 - $1200); public health agencies ($1800 - $7200), and school districts ($240 - $2100).

**Payers** -- Payer are contributing a subscription fee based upon a formula derived by the Minnesota Council of Health Plans (MCHP) for their dues.

#### Obtaining Agreement on Fee Structure

Minnesota is unique because it has very large integrated networks with a high percentage of employed and contracted physicians in the state rather than independent physicians. The bulk of subscription fees will come from payers and large integrated delivery networks, MN HIE also wants other participants -- hospitals using community providers, long-term care, public health, and school districts -- to pay, but their fees are modest to ensure participation. At this point, participants have access to all services, but we may charge for additional services such as ePrescribing.

We looked at the fee structure from many different angles and agreed this would not be a transaction model because it is a barrier to usage. We put a cap on the fees so that extremely large healthcare organizations such as Fairview and Mayo Clinic, that have thousands of providers, would not be overburdened by the fee structure.

**Business Case for Sponsors** -- If you look at the HIE from a purely claims and administrative transaction perspective, there are a lot of point to point claims and administrative solutions in Minnesota. The reality is that the community is paying a pretty heavy price tag for this. MN HIE has approached data exchange differently for the clinical side and tried to create a utility that everyone can use. In the end, it is an expensive proposition to maintain point to point connections. That weighed heavily into the decision.

#### Benefits and ROI

**General Value Propositions / ROI**
- 'One Stop Shop' for clinical and administrative information
- Reduced risk of clinical errors
- Reduction in redundant or repeat testing
- Quicker access to relevant clinical information
- Increased patient satisfaction
- Eventual reduction in staff time and effort (i.e. public health reporting)

**Value Proposition for Physicians and Long-term Care:** Physicians: Can exchange clinical information between providers with referral relations. Long-term care: Inexpensive route to obtain technology and access to information such as for medication reconciliations.

**Community Benefits** -- The goal is improved patient safety and quality of care. In the long-run, people will believe in the HIE if it results in reduced expenditures from a reduction in duplicate tests and appropriate decisions around treatment. The metrics to determine community benefits is a challenge and needs to be developed. The real value of HIE needs to evaluated looking at it as a total ecosystem for the community.

#### HIE Participation

**Physicians**

There is already a large adoption rate of 75-80% in the state. We have a half a dozen fully integrated delivery system in the state that serve 70% of the population and own many hospitals. A certain percentage of the physicians are employees and many are contracted with the health systems. Whether employed or contracted, the physicians are using the provider home EMR.
# Minnesota Health Information Exchange (MN HIE)

## Interview Summary

- **Financing**
  MN HIE doesn’t host EHRs. We discussed whether to do this at length. The state already has a high percent of EHR adoption, and providers will know better than us what EHR fits their environment. A clinician can use the system without an EHR, but they will not qualify for Meaningful Use.

- **Medicaid**
  We have had discussion with Medicaid about MITA funding opportunities. We haven’t worked out the details on how this would happen.

- **Public Health**
  Public health will pay fees also. We haven’t set the subscription fee yet. Public health will benefit from a common exchange that enables provider reporting to public health, access to the state immunization registry and other services.

- **IDNs**
  Of the IDNs in Minnesota, only Fairview and Health Partners are sponsors. The other large IDNs are still evaluating a variety of options. There is a strong presence of Epic in this state -- The EPIC User Group recently announced it has exchange services being used by Minnesota providers.

- **Incentives**
  Not involved

- **Regional Extension Center (REC)**
  MN HIE has a good working relationship with the REC, Key Health Alliance, which services Minnesota and North Dakota. The REC is made up of three organizations including Stratus Health, the QIO. We are looking for a more streamlined process between the REC and MN HIE to augment education and outreach so providers are aware of both the HIE and the REC. Providers are more focused on established their roots with a qualified EHR solution. Health information exchange is almost a secondary thought at this point.

- **National Health Information Network (NHIN)**
  MN HIE will be implementing its NHIN gateway solution in early 2011. Since NHIN Connect is really a set of policies, standards and protocols, organizations that intend to implement NHIN must be aware there is significant work.

- **Rural Areas**
  MN HIE is working through the MN Rural Coop Association and Department of Health to work with this segment of the industry.

- **Telehealth**
  We are not engaged in this at this point. There are pockets of experimentation in the state, but no major grants.

- **Labs and Radiology**
  We can access and display lab history. Our challenge is to find an equitable business model for commercial labs and radiology. We don’t have any commercial labs hooked up yet. With Fairview, that info will be available through the CCD exchange. We are building a separate portal for labs and radiology reports only. The images are about a year out.

- **Social Security Administration (SSA)**
  There is a value proposition for the provider. We intend to offer this as a service after our NHIN gateway implementation dependent upon a mutual implementation schedule with SSA.

## Interviewee and Sources

**Interviewee:** Michael Ubl, Executive Director, MN HIE in September 2010

**Sources:**


### Rochester RHIO (GRRHIO)

#### Interview Summary

**What Makes the Rochester RHIO Unique**

Rochester RHIO has been uniquely successful at obtaining sustainable stakeholder commitment from all three major stakeholder groups -- hospitals, physicians, and payers. The payer group includes both the insured and self-insured employers. The payer fee mechanism was developed by the payers and is similar to the Vermont model, but without a mandate. The RHIO was able to successfully leverage the HEAL-NY grants to obtain sustainable stakeholder commitment.

#### Background

<table>
<thead>
<tr>
<th>Year Started</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year HIE Implemented</td>
<td>2008</td>
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</table>

**Mission and Strategy**
Rochester RHIO is part of a nationwide effort to improve our health care system. In collaboration with the New York State Department of Health and dozens of regional health care providers, we are working to improve how health care is delivered. With Rochester RHIO, health information is right where it is needed. This secure online resource gives authorized medical professionals fast easy access to the information they need to give the best care.

**Services**
- Clinical data exchange

**Geographic Reach and Primary Location**
Geographic Reach: 10 county service area around Rochester, NY; Primary Location: Rochester, NY

**Governance Structure**
- Non-profit, community-run organization developed by and for physicians, hospital systems, health insurers, and privacy officers.

**Stakeholders**
Board representatives: Monroe County Medical Society, Xerox, MVP Healthcare, Physician, Unity Health, Empire Justice Center, Excellus BCBS, Rochester General Health, Thompson Health, Rochester Business Alliance, and University of Rochester Medical Center.

**Functionality**
- Virtual health record, results delivery, ePrescribing, and connectivity to immunization registry. Also do elder care and images. New 9/10 is certified hosted EHR to help physicians meet Meaningful Use.

**Technology**
- Hybrid, federated architecture; Axolotl’s Elysium® Exchange

**Participants**
Participants include all 15 hospitals in the 10-county Rochester service area, along with all lab networks, all radiology groups, health insurance companies and other data providers. There are 3,000 authorized health care providers and over 1,000 physicians participating.

**Volume of Activity**
The RHIO piloted in 2008. At the end of 2009, there were only 680 out of 3,000 owned and independent physicians and 2,200 users. In August 2010 there were over 1,000 physicians, over 360 practices, and over 3,500 users and growing.

**Current Plans**
Since March 2010, Rochester-area health care providers are also able to see medical and social service supports that human service agencies provide senior patients, alongside their clinical information. There are 50 area eldercare agencies that are being included in the health information exchange over the next few months.

**General**

**Business Model**
The RHIO used State of New York grants along with matching community contributions for a faster launch to reach the tipping point, which occurred in 2008. Now the RHIO has high levels of provider participation and plans a fully sustainable model through fees in 2011 (1/3 from hospitals and 2/3 from payers) plus fees to physicians for web-based EHR.

**Current Issues and How to Address Them**
We are all watching at the federal level. NY state has a clear vision for services that are broader than the federal level. Stakeholder buy-in is not a key issue any longer for us. Our core focus is to complete the last round of NY HEAL grant service expansions and to continue to deploy and sign up docs and patients.

**Meaningful Use Impact**
We are providing a certified Web-based EHR that will meet Meaningful Use requirements.

**Financial**

Copyright PAeHI 2010-11
### Rochester RHIO (GRRHIO)

#### Interview Summary

**HIE Start-up Costs**

| Initial funding from HEAL-NY Grant: $4.4 million state grant and $1.9 million in funds from local businesses, hospitals and health insurers. Second funding from HEAL-NY: RHIO Expansion of $6.1 million with community match of $566,000. Third funding from HEAL-NY: EMR adoption of $6.7 million with community match of $650,000 |

**Annual Costs**

| Operating costs are $3 million. All expenses cover 15 hospitals, 3,000 physicians, all radiology and all labs in 10 regions. |

**Fee Structure**

| Hospitals -- In 2011, the RHIO will increase or add annual hospital contributions of $1 million to supplement the $2 million annual contribution by payers to cover the $3 million budget. Of the hospital amount, 2/3 will be paid by 5 large by urban hospitals and 1/3 by 10 rural hospitals. |
| Physicians -- Traditionally, there has been no charge to physicians. Starting in September 2010, the RHIO will charge $200 per mo. per physician for certified hosted EHR. 37 practices are moving forward with the hosted EHR as well as a few smaller hospitals. |
| Payers -- Currently, private and self-insured payers pay $2 million annually calculated based on an add-on to each hospital discharge. The payments by payers are made to the hospitals, which then pay the RHIO for services. |

**Obtaining Agreement on Fee Structure**

| Hospitals -- The 5 large health systems and the 10 smaller hospitals have each agreed to their respective share of the fees. They are negotiating within each group to determine the allocation of fees for each hospital. |
| Payers -- The payer claims model is similar to the Vermont financing model without the state mandate. The payers are paying higher fees to the hospitals and then reporting the claims each month to the hospitals. The hospitals then pay the RHIO for services. The rate is set annually by the RHIO Finance Committee to meet the RHIO goals. This amount changes over time as participation increases. This model was developed by the payers. Medicaid and Medicare are not included in the model because terms couldn’t be negotiated. |

We have achieved agreement on the fee allocation through "heated battle" and have considered lots of fee structures. Currently, the hospital contribution will be based on results delivery volume, not bed type. Hospital participants may not want to use this formula going forward, however. We will reassess each year. For example, some hospitals don’t have as much results delivery going through the RHIO but are using the Virtual Health Record and Portal. Also, some hospitals that are tightly integrated with point to point interfaces are using less results delivery. So, it is an imperfect model. In other places in New York, RHIOs are mostly using the bed allocation model. |

**Benefits and ROI**

| Hospitals: Value has already been seen including improved results delivery; ease of information access; more efficient EMR integration efforts including cost savings; improved medication history & ePrescribing; improved eligibility access; better support for transitions of care; and support for payer based disease management. |

**HIE Participation**

| Physicians |
| As of August 2010, the RHIO had 1,057 participating physicians, 361 practices and 3,448 participating users. There are 3,000 physicians in the region including owned and independent. We have many other potential users such as home care. However, we do not know the full potential users beyond the physicians. |
| We attribute success based on the energy of our two deployment staff and the increase in data in the system. We only had 680 physician at the end of 2008 and 2,200 at the end of 2009. In 2008 we were trying to populate the system rather than focusing on physician adoption. We hit the tipping point at the end of 2008. |
| We also have a well articulated marketing campaign. We have a communications team with participation by all stakeholders. The focus is keeping the RHIO in the local news media to get inexpensive marketing about success stories and new services. |
## Rochester RHIO (GRRHIO)

### Interview Summary

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
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<tbody>
<tr>
<td>Medicaid</td>
<td>The entire state grant funding out of NY Dept. of Health is Medicaid funding. When we did the claims assessment on payers, we did not include Medicaid. The payers were agreeable to this because Medicaid has funded millions already. Long-term, we will bring in Medicaid into the funding structure.</td>
</tr>
<tr>
<td>Public Health</td>
<td>The RHIO has a board member who is the local Public Health Director. We have done a lot of work for public health related programs. We are just starting access to TB clinics and foster clinics. Currently, even though public health has several contracts with us, their clinics don't have access to our services. We also provide services to seniors through the Office of Aging. This enables the RHIO users to see aging services. The entities we work with are sub-contractors to public health. GRRHIO connects to the immunization registry. We are not doing reportable conditions yet. When we work with public health, we bump up against a slightly different privacy and security policy and regulatory landscape.</td>
</tr>
<tr>
<td>IDNs</td>
<td>Originally, some of the IDNs did not want to participate in the RHIOs in the state and in this region. This was addressed at the state-level. There is now a requirement for IDNs with IT expenditures over a certain amount to obtain RHIO sign off on the request and identify what data will be exchanged. The state has been funding 11 RHIOs plus CCITI NY (Continuum of Care Improvement through Information) and has seen the permutations arise since 2006.</td>
</tr>
<tr>
<td>Regional Extension Center (REC)</td>
<td>The state has two RECs -- NYC and the rest of the state. We work closely with one of the two local outreach agents, Monroe County Medical Society. They have a history of doing REC-type services as does the RHIO (with community health clinics and behavioral health). We have stepped away from this service now and focus on results delivery and interoperability. There are at least 11 different EHR platforms in our region. It is not clear to me how the REC can service all of these vendors.</td>
</tr>
<tr>
<td>National Health Information Network (NHIN)</td>
<td>It is not clear how NHIN Direct or NHIN Connect will tie-in to our strategy.</td>
</tr>
<tr>
<td>Rural Areas</td>
<td>Rural areas have been quick to pick up on our services. We are providing services that they could not otherwise afford. Also, they don't have a lot of pre-existing interfaces to replace. We have asked the rural hospitals to pay less than the urban hospitals going forward for a total of $300,000 divided between 10 hospitals.</td>
</tr>
<tr>
<td>Telehealth</td>
<td>Another group received the FCC telehealth grants. We do not want to compete with them. We do see that there are regional telestroke initiatives that are opportunities. The RHIO is currently doing imaging.</td>
</tr>
<tr>
<td>Labs</td>
<td>There are no national labs in this region; just 3 hospital-based regional labs. The hospitals agreed to buy the same SoftLab interface for all. Hospitals with labs are paying higher fees than the other hospitals.</td>
</tr>
<tr>
<td>Social Security Administration (SSA)</td>
<td>This looks like a sustainable funding source and something we would look into in the future.</td>
</tr>
</tbody>
</table>

### Interviewee and Sources

**Interviewee:** Ted Kremer, Executive Director, Rochester RHIO in September 2010

**Sources:**


Utah Health Information Network (UHIN)

Interview Summary

What Makes UHIN Unique

By starting with the Claims HIE in 1993, UHIN was able to build a sustainable HIE with high stakeholder returns within the first year and obtained stakeholder support from all stakeholder groups -- hospitals, physicians, and payers. Fees were based on relative benefits received for hospitals and payers and have dropped 30% in the last six years as more participants joined. UHIN implemented an expanded Clinical HIE in 2010. Based on strong financial returns from the Claims HIE and a tradition of collaboration, UHIN stakeholders agreed to share the costs of the Clinical HIE by 1/3 hospitals, 1/3 physicians, and 1/3 payers. The Clinical HIE is in the early stages of populating the Master Patient Index.

Background

<table>
<thead>
<tr>
<th>Year Started</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year Implemented</td>
<td>1994 (administrative transactions); 2004 (clinical data exchange); 2010 (expanded clinical data exchange)</td>
</tr>
<tr>
<td>Mission and Strategy</td>
<td>The long range goal of UHIN is to provide the healthcare consumer with services that reduce costs and improve healthcare quality and access.</td>
</tr>
<tr>
<td>Services</td>
<td>Administrative exchange and clinical exchange</td>
</tr>
<tr>
<td>Geographic Reach</td>
<td>State of Utah; Primary location: Murray, Utah</td>
</tr>
<tr>
<td>Governance Structure</td>
<td>UHIN is a 501(c) 3. It is a broad-based coalition of Utah health care insurers, providers, and other interested parties, including the Utah State government.</td>
</tr>
<tr>
<td>Stakeholders</td>
<td>Health systems, hospitals, clinics, physicians, payers, universities, and state govt.</td>
</tr>
</tbody>
</table>

Functionality

| Administrative Services | UHIN’s administrative services include provider and payer claims, remittance advice, claims status, eligibility, enrollment, acknowledgement, attachments, and other administrative transactions. Members can send and receive messages to any other authorized members. Providers include medical and dental clinicians. |
| Credentialing services (Speedi) | UHIN’s services provide a simplified method for providers to submit credentialing information to multiple payers with the click of a single button. UHIN Speedi is an internet based tool allowing providers to complete and submit one application to multiple payers utilizing a standard data set accepted by Utah payers. Providers have the ability to send attachments electronically. |
| HIPAA Certification (Claredi) | UHIN has formed a strategic alliance with Claredi, a third-party testing and certification service to certify a provider to create HIPAA transactions in the eyes of other health care entities, including payers, without individual certification. |
| Clinical Health Information Exchange (cHIE) | UHIN securely provides, with patient consent, critical health information (lab reports, discharge summaries, medication histories, allergies, problem lists, etc). cHIE is just starting the Virtual Health Record (inquiry), free CCHIT certified EMR, ePrescribing, referrals, electronic report and results delivery. It is on-line to bring up lab orders. cHIE delivers reportable conditions to public health at the discretion of the provider. |
| Virtual Health Record | Includes access to medical information on patients shared with other cHIE clinicians. Data will include, but is not limited to: lab results, radiology results, medication histories, allergies, discharge summaries, other hospital reports, transcription reports, and physician notes. |

Technology

| HTP, Inc. developed the current administrative system in 2000. HTP was purchased by Relay Health. Axolotl was selected as the vendor for UHIN’s clinical information exchange network (cHIE) in January 2009. Directpointe houses one of our redundant sites for the administrative exchange. |
| UHINet is an Internet-based clearinghouse using standardized transactions with interfaces between payers and medical billing and using UHIN’s internet portal. Centralized Utah State Insurance Dept. has adopted UHIN standards as state standards. |
### Utah Health Information Network (UHIN)

#### Interview Summary

UHINet is the "backbone" for securely transmitting health care administrative and clinical transactions and messages between UHIN members through a single member connection. UHIN I is connected to more than 4,500 health care payers nationally (including Medicare and Medicaid), clinicians, hospitals, clearinghouses, labs, and pharmacies. UHIN connects to over 34 clearinghouses.

UHINet II is a "payload independent" web service. This means that any transaction format (X12, HL7, PDF, tiff, NCPDP, DICOM, Rendered Image, etc.) can be transmitted through the gateway. UHINET has been EHNAC certified since 2004 which means it is secure, fast, and backed up with excellent member service. UHIN members can connect directly to UHINet using a standards compliant practice management system or with other software such as UHINt (available at no charge).

#### Participants

**Administrative Exchange** -- There is very broad participation in the administrative services and growing support for clinical services, which are in the start-up phase. Key organizations participating in UHIN include: Health systems -- HCA/Mountain Star (6 hospitals), IASIS (4 hospitals), Intermountain Healthcare (23 hospitals), University of Utah Health Sciences Center (4 hospitals), and Independent Rural Hospitals; 9 clinics; Payers -- DMBA, EMIA, Medicaid, PEHP, Regence, Select Health; and Utah government -- Dept. of Health, Insurance Commissioner, Office of IT, and HIT Governance Consortium.

**Clinical Exchange** -- This exchange has started with 9 practices and clinics.

#### Volume of Activity

**Administrative** -- 100% of the hospitals, labs, local health departments, and mental health centers are connected to UHIN. 85% of the commercial claims are paid within 7 days. UHIN also connects 95% of the physicians, 90% of the chiropractors, and has started to work with the dentists. There are 200-250 million transactions/year, mostly eligibility.

**Clinical** -- UHIN is just starting clinical exchange and there are 500,000 identities in the MPI so far. When we talk with other HIEs, one of their consistent pieces of advice is to make sure you have a lot of data in the well before you turn on the system.

#### Other Background

**HITECH Act** -- The Utah Dept. of Health holds the ARRA Cooperative Agreement on behalf of UHIN, the state designated entity. Medicaid is within Dept. of Health. HealthInsight is the REC.

**HIE Certification** -- UHIN was the first HIE to be accredited in the country. It has been accredited under the Electronic Healthcare Network Accreditation Commission’s (EHNAC) health information exchange accreditation program. Accreditation builds trust. Any HIE can download HIE requirements from the EHNAC site to identify a list of actions for business and IT plans.

**Beacon** -- UHIN is serving as the HIE on the $15.79 million Beacon Grant issued to HealthInsight of Salt Lake City. The Beacon Grant is focused on diabetic care.

**VA Pilot** -- UHIN is also doing a pilot with the VA Rural Health exchanging the continuity of care document between the VA in Grand Junction and Allen Memorial Hospital in Moab, Utah. Eventually, UNIN plans to connect the VA to all providers.

### General

#### Business Model

**Administrative Exchange** -- This has had a very strong business case from the beginning because of the efficiencies of having a shared system. Fees to cover costs are allocated based on benefits received -- 70% payers and 30% providers. Fees have dropped 30% in the last six years because of economies of scale.

**Clinical Exchange** -- This exchange has followed a similar model as the Administrative Exchange. Fees to cover costs are allocated based on benefits received -- 1/3 hospitals, 1/3 physicians, and 1/3 payers. UHIN is in the early stages of implementing the cHIE business model.
Utah Health Information Network (UHIN)

Interview Summary

| Current Issues and How to Address Them | Implementation -- It is a complex process implementing a hospital into the clinical exchange. When connecting the major data sources, each data source has at least 4 data feeds. Implementation difficulty is dependent on how far along the hospitals are internally regarding eHealth adoption. The rural areas are not as far along in adopting eHealth. Right now we are good on stakeholder buy-in but the technical process takes time. |
| Privacy and Security (P&S) -- For the clinical side, this was addressed with the EHNAC examination. We are in the process of bringing up a P&S Committee. The community tells us what to do through the committee process. The P&S Committee includes two privacy lawyers, two privacy officers, business people and others. It will write policy around HIE access issues such as: "UHIN will validate identity of all clinician users." |
| Patient Consent -- There is no legislation in this state on patient consent. We are pushing back against consumers limiting specific pieces of information. Their record has to be complete for the physician to use it. HIE is to improve quality of care. How can you improve quality of care if physicians don’t have complete information? If a patient doesn’t want data shared, they need to opt out. If anyone tells you that you can hide sensitive data, it is not technically possible. |
| Stakeholder engagement -- We address barriers by engaging the community, frequently through committees. We engage people in topics that have an impact on their home companies. We engage people because they are experts. |

| Meaningful Use Impact | UHIN offers a certified EHR that meets Stage 1 Meaningful use requirements. |
| Financial | The original start-up costs were $35,000 when claims transactions began as a dial up modem. Clinical start-up costs are around $4-5 million. |
| Annual Costs | Annual costs are $3-4 million on the administrative side. They are projected to be $3-4 million on the clinical side. |
| Fee Structure | Administrative Exchange -- Since inception, UHIN has operated through membership fees. Payers pay 70% of the fees on a per-click basis. Providers pay 30% of the fees as an annual membership fee. |
| Clinical Exchange (eCHI) -- Each stakeholder group (hospitals, physicians, and payers) pays 1/3 of the fees. Hospital fees are based on a straight percentage of market share calculated on inpatient discharge data for the previous year. Physicians pay on a scaled practice size. A one physician practice fee is $600/year and is scaled down for larger practice sizes. The payer fee is $0.085 per member per month and is capped at 250,000 covered lives. |

Obtaining Agreement on Fee Structure

Administrative Exchange -- UHIN has had a sustainable claims model since 1993. Since its inception, UHIN has operated through membership fees. The UHIN formula for determining membership fees first involved a determination of who receives value for the transaction. In the case of the claims model, the board decided that payers received 70% of the value and providers received 30% of the value. The basic idea is that the “price” of each claim exchanged through UHIN is divided 70-30. Each stakeholder group pays for their share of the value received by exchanging that claim. UHIN payers pay a click fee for claims and UHIN providers pay an annual membership fee. The fee for processing claims has been lowered 30% in the past six years due to increased volume.

Clinical Exchange -- We spent two years talking about fees in the state. The Board decided the initial value split of 1/3 hospitals, 1/3 physicians, and 1/3 payer. Each stakeholder group decided how to structure their own membership fees. We found three HIEs that were paid for 100% by the payers, 100% by the physicians, and 100% by the hospital. This validated the value of the HIE for each group. Intermountain/Select Health is the major payer in the state. Because they have data already, they don’t have a strong need for the HIE. However, because they are participating, the HIE is inexpensive for everyone.
**Utah Health Information Network (UHIN)**

**Interview Summary**

*Physician Financial Participation* -- We found that in order for physicians to value something, they have to pay for it. If you get them to pay, then they demand service. But, it’s important to make it inexpensive. We charge a very low fee for clinics. There is no charge for free clinics.

**Benefits and ROI**

*Administrative Exchange* -- The success of the Administrative side of UHIN was having a solid business case that people would pay for. That remains true today. On the administrative side, UHIN is dealing with office managers and billing staff at the hospitals and practices. They understand the value of money.

Both payers and providers benefit from standardized data formats that result in tremendous cost savings as each can automate transactions they send and receive. We didn’t calculate an ROI for administrative data because it was obvious.

*Clinical Exchange* -- When UHIN moved into clinical exchange, we had to identify the business case, which is more complex than the Admin HIE. On the clinical side, UHIN is dealing with physicians who are less interested in the overall business case. They want what information they want when they want it at a low cost to their practice. They don’t know how hard their staff works to get this information to them or at what costs.

Financial benefit analysis was limited nationally in 2007. So, to validate the benefit for the clinical exchange, we found three HIEs that were funded by three different stakeholder groups to prove the value to each of the stakeholders.

**HIE Participation**

**Physicians**

*Administrative Exchange* -- We have 95% physician adoption for claims exchange.

*Clinical Exchange* -- We have nine practices and clinics using the clinical HIE, but we are at the "filling the well" stage. The rural hospitals are also interested. Our emphasis is on getting clinics to be data sources. According to a November 2009 Utah Legislative Report from interviews conducted by HealthInsight, an estimated 61% of all outpatient primary care practices in Utah now have EMR systems in place.

**Medicaid and Public Health**

*Clinical Exchange* -- The Utah Dept. of Health holds the ARRA Cooperative Agreement on behalf of UHIN, the state designated entity. Medicaid is within Dept. of Health, and HealthInsight is the REC. All of these entities are working together. We are feeling our way through this. The history and underlying culture support the community. When people moved to Utah with Brigham Young, they had to survive a harsh environment together.

Medicaid is slowly figuring out its role and plans. We are holding lots of meetings with them, and they are sitting on the UHIN Board. My job is to educate Dept. of Health and Medicaid about HIE. Medicaid has been key to the success of UHIN so far. How do you keep Medicaid’s costs low by having a designated a single front end (UHIN)? Our payers on the administrative side only use UHIN because it is cheaper for them. We want a similar structure on the clinical HIE side.

**IDNs**

Our IDNs have varied in their ability to connect to the cHIE. Everyone is different.

**Incentives**

We are not doing this.

**Regional Extension Center (REC)**

We are aligned with HealthInsight (REC) -- who calls on whom, creating materials, and sharing customer lists. There is no bundled pricing.

**National Health Information Network (NHIN)**

The VA is introducing us to NHIN. To date, providers do not want to join NHIN.

**Rural Areas**

The fee structure for the rural hospital is the same as urban hospitals, but scaled to their size so they pay less.

**Telehealth**

Utah Telehealth Network (UTH), a NFP, has received an FCC grant. They put routers and T1 lines in. A lot of UHIN success in the rural area is because of UTN. Every member pays their own broadband, not UHIN.
Utah Health Information Network (UHIN)

**Interview Summary**

<table>
<thead>
<tr>
<th>Labs</th>
<th>We have created a fee structure and an Service Level Agreement for labs. They will pay for results delivery and ordering. UHIN will be the result of record for the labs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Security Administration (SSA)</td>
<td>SSA is interested in our participation. We would like to do a pilot in about a year. We are very impressed with MedVirginia’s results with their pilot. But, this is difficult to sell to the hospitals. They need to understand that they won’t have to spend as much time prepping data to send to SSA.</td>
</tr>
<tr>
<td>Other Income Sources</td>
<td>Nursing homes, long-term care, hospice and home health are potential providers. We are building fee models for this world. Research using the cHIE is not allowed at this point. A question we need to consider: What is the difference between research and quality?</td>
</tr>
</tbody>
</table>

**Interviewee and Sources**

**Interviewee:** Jan Root, PhD, President, CEO of UHIN, in September 2010

**Sources:**


Vermont Information Technology Leaders, Inc. (VITL)

Interview Summary

What Makes VITL Unique

A key state program has been the Patient Centered Medical Home Pilot, which is central to the Governor’s Blue Print Initiative focused on health care transformation. To support this program, the legislature has established an HIT Fund from 2008 through 2015 funded by an assessment on medical claims. The intent is for VITL to have established sustainable funding by 2015, which in the future will revolve around the data exchange and support services for providers. Building on the success of the pilot, VITL has become the state-level HIE and the Regional Extension Center for the state bringing three important components of health care transformation under one organization.

Background

<table>
<thead>
<tr>
<th>Year Started</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year Implemented</td>
<td>2008</td>
</tr>
</tbody>
</table>

Mission and Strategy

To collaborate with all stakeholders to expand the use of secure health information technology to improve the quality and efficiency of Vermont’s health care system. **Our Vision:** A transformed health care system where health information is secure and readily available when people need it, positioning Vermont as a national example of high quality, cost effective care.

Services

Medical home pilot, clinical exchange, and ePrescribing pilot

Geographic Reach

State of Vermont

Governance Structure

VITL is a 501(c)(3) multi-stakeholder corporation formed by a broad base of health care providers, payers, employers, consumers, and state agencies. VITL is a federally-funded Regional Extension Center, which assists health care providers in implementing electronic health records and achieving meaningful use of EHRs. It is also operates Vermont’s statewide health information exchange (VHIE).

Initially, the board consisted of 21 directors, which enabled the group to achieve buy-in from a large number of stakeholders; now, the board has 11 directors. Board-level advisory committees for health care providers and consumers have been created. These committees are chaired by a VITL board member, who is responsible for presenting recommendations of the advisors to the full board for consideration.

Stakeholders

Providers, payers, employers, consumers, and state agencies.

Functionality

**Medical Home Pilot** -- VITL is providing comprehensive data services to the Vermont Dept. of Health’s Blueprint for Health Initiative Medical Home Pilot Project. Participating physicians use a patient registry or EMR with access to a Continuity of Care Document that includes laboratory, radiology, and chronic disease data.

**ePrescribing** -- Through its ePrescribing initiative, VITL provides medication history, formulary data, and drug interaction checks. There is no software to install or download in this program.

Technology

VITL currently uses GE Healthcare Centricity, and as of May 2010, Athena Health Inc. was announced as the new preferred EHR partner, joining Allscripts and Fletcher Allen Health Care's PRISM system. The VHIE is one of the first exchanges in the country to use the standards endorsed by the national Health Information Technology Standards Panel (HITSP) and IHE Profiles. This enables participating providers whose electronic health records systems are compliant with these standards to be connected quickly and at a significantly lower cost. The core infrastructure of the VHIE is certified for compliance with industry standard information security practices by the Electronic Healthcare Network Accreditation Commission (www.ehnac.org).

Participants

**Lab Results Delivery** -- Northwestern Medical Center, Rutland Regional Medical Center, Southwestern Vermont Medical Center, Brattleboro Memorial Hospital, and Fletcher Allen Health Care.

Volume of Activity

11 out of 14 hospitals are doing something -- results delivery, medical home pilot or medication histories or some combination of each. In January 2010, ten practices were participating in results delivery, nine practices were participating in the medical home pilot, and three practices were using medication histories. Practices continue to join these programs.
Vermont Information Technology Leaders, Inc. (VITL)

Interview Summary

<table>
<thead>
<tr>
<th>Other Background</th>
<th>In 2010, VITL became the Vermont REC and the state exchange, VHIE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Plans</td>
<td>Continuity of care documents used for the medical home pilot will be made available state-wide as part of the HIE plan. Radiology reports will also be provided.</td>
</tr>
</tbody>
</table>

**General**

**Business Model**
The primary health care initiative of the state has been the Patient Centered Medical Home Pilot, which is central to the Governor’s Blue Print Initiative. To support this initiative, the legislature has established an HIT Fund from 2008 through 2015 funded by an assessment on medical claims. The intent is for VITL to have established sustainable funding by 2015.

**Current Issues and How to Address Them**
VITL has developed an “Opt-In” policy for HIE; no information is shared with a provider unless an individual specifically consents in writing. This has largely been driven by strict privacy laws in Vermont where under the patient privilege statute, the patient must approve of any information released from their provider; privacy policies were approved by the Board in 2009.

The reason that VITL gets so much legislative support is that it is part of the Blue Print Initiative supported by the governor, which includes the Medical Home Pilot. The pilot is the center point of the state program. This enabled VITL to put the claims funding in place. The Medical Home Pilot includes NCQA based evaluations at the medical home level. Depending on the level, physicians get a bonus that goes up to $250/mo. per patient. This could mean $50,000/year per physician. This is a big incentive for practices to be a high functioning medical home. A future sustainability model for VITL could be to work with physicians and use a % of the incentives. Vital is trying to be sustainable by 2015.

**Barriers**
The good and bad news at the state house is that people are interested. All of this activity is hard to do at once (medical home, HIE, REC, and more). For the HIE, there are policy, privacy and security, and legal issues. The REC is a start-up. There are also limitations on the vendor’s ability to deliver against sophisticated standards. That is a significant challenge and a surprise. We have stepped back from full information exchange using XDX protocols because vendors can’t do it.

**Meaningful Use Impact**
All of the practices can meet Meaningful Use with messaging and the Continuity of Care Document (CCD). We already use the CCD. So, this is a stepping stone for clinical exchange. Systems can read, but not consume a CCD. With the Medical Home Pilot, we already have the base protocols in place for lab exchange, and we are building it out to more practices. For eRX, we have the infrastructure and incentives from the HRSA grant to make sure physicians have turned on eRX. We have to make sure pharmacies can accept these and the practice can do it. We will work the physicians in the way that makes sense to them -- for some it is through the hospitals, and, for others, it is through the REC. The exchange will help the hospitals distribute the lab data. We are working with FQHCs through a HRSA grants. That will help tie them to the medical home initiative.

**Financial**

**HIE Start-up Costs**
Initially, VITL received $2 million from VT Dept. of Health and $1 million from community stakeholders. In 2010, VITL received $6.7 million to be the HIT Regional Extension Center and $5 million through the Vermont Dept. of Human Services to serve as the state exchange, VHIE. VITL has smaller grants and contracts worth approximately $650,000.

**Annual Costs**
The original annual operating expenses were $1.5 million. Current operating expenses are much higher and growing. The budget now includes VITL, REC, and VHIE.

**Fee Structure**
**HIT Fund** -- The state puts 2/10 of 1% (0.199) of medical claims into the basic HIT Fund. This fund supports VITL as well as other initiatives through the HIT Coordinator and State Health Reform. That has provided about $2.1 million per year from 2008 through 2015 for a projected total of $32 million over 7 years. There is a general misperception that the claims fee model is sustainable. Rather, it is intended to be a stop-gap to last 7 years until a sustainability model is developed.

**Other Sources of Funds** -- Some additional funds come directly to VITL and other funds come as part of matched funds. For instance, the HIT Fund does the 10% REC match as well as the 10% Medicaid match.
Future Revenue Streams -- In the future, we will get revenue from 1) the exchange and 2) support services for practices that we engaged with the REC, and 3) helping providers to achieve Meaningful Use and to use technology effectively.

Medical Home Pilot -- The Medical Home Pilot is key to sustainability. The challenge is to find a return for the people who are paying the bills. Today we are getting that from the grants. Both the payers and providers will see benefit from Health Care Reform. We don’t yet know how it will turn into recurring revenue. We will start modeling this out and consider the different directions Healthcare Reform can go.

The Blue Print program does ROI analyses on the Medical Home Pilot based on changes in practice patterns and disease management.

Physician adoption is in the hundreds for the Medical Home Pilot consisting mostly of lab and physician EHR feeds. We have 2,500 physicians in the state. We estimate that 20% use EHRs.

Vermont’s Medicaid Agency is making a voluntary annual contribution of approximately $250,000 to the overall HIT Fund in support of VITL. They are making this contribution because they are not a part of the mandated claims assessment on payers.

We work very closely with Medicaid. Medicaid is participating in the Medical Home Pilot. We are looking for ways to connect their care management team, and they are participating financially. We are also getting their pharmacy data connected to VITL’s eRX application more cost effectively and are working with them on the public health immunization registry.

The immunization registry is just now starting, and we are having initial discussions on reportable conditions reporting from hospitals. Public health is not a current funder but may be in the future.

We don’t have true IDNs. There are two medical centers that are the bus for tertiary care.

All of the payers in the state are working on the Medical Home Incentive Pilot Program -- BCBS of Vermont, MVP Health Plan, and CIGNA. The Pilot includes 60,000 patients, which is 10% of the population. Participating primary care practices receive an enhanced per member per month (PMPM) payment based on the quality of care they provide and is in addition to their normal fee for service. In addition, the insurers share the costs of the Community Health Teams that support the program. The goal is to expand this program.

A primary care physician in a medical home model can receive an extra $50,000 per year. This is a different number than a onetime Meaningful Use (MU) incentive provided through the HITECH Act. The reason a physician should do this is because of the state initiative that changes reimbursement. The reason to do it now is because of MU incentives.

It has been good to be both the REC and the HIE. When I talk to the RECs that aren’t close to the HIEs, it surprises me. It has been terrific being both.

The only public hospital with a NHIN Connect is with the VA. We aren’t clear how to do this at this point. We are thinking about NHIN as the exchange for New Hampshire. We will use that as our basic approach, but we want to see if it is real first. It is in our state plan.

It is going on in the state, but we are not in the center of this activity. There are holes in broadband in this state, and there is a big initiative which will help. At this point, it remains an issue, but there is plenty for VITL to do where broadband exists.

We are charging fees to commercial labs, but we are not charging lab fees to hospitals if labs are embedded in the hospitals. We don’t have free standing radiology. They are imbedded in the hospitals. We are not charging the hospitals today for this.

We are looked at the proposal that came out last summer. We don’t have the right pieces including a provider ready to go. SSA will be a good use of the NHIN.

We are not engaged yet because we have the HIT Fund. This year we are planning what’s next.
## Interview Summary

### Interviewee and Sources

**Interviewee:** David Cochran, MD, President and CEO, in September 2010

**Sources:**

8.9 Appendix 9—Acknowledgments and Contributors

The Board of Directors of the Pennsylvania eHealth Initiative gratefully acknowledges the significant contributions of many individuals and organizations that have assisted in the development of this White Paper. In particular, the Board thanks Dr. Ken Coburn and William "Buddy" Gillespie for serving as co-chairs of the effort, and Mark Jacobs, Steve Fox, and Chris Cavanaugh for their guidance and leadership throughout the project. Members of the PAeHI HIE, and Policy and BAT Committees all deserve thanks and congratulations for the group's efforts through numerous conference calls, email revisions, and two All-Committee event breakout sessions to collaboratively research, outline, draft, and revise this White Paper. The Board would also like to convey a special thanks to Denise Reeser, Cam Brown, and Barb Burke for their exceptional effort, command of the topic, and for the quality of their work. Finally, the Board acknowledges the following individuals whose significant contributions merit individual recognition:

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Camilla Hull Brown, MBA, Principal and Founder of Strategies for Tomorrow

Camilla is Principal and Founder of Strategies for Tomorrow. She brings 25 years of experience in strategic planning, change management, and collaboration building to assist community collaborations and state-level entities implement health information exchange and health information technology (HIE/HIT) initiatives. In her consulting roles, Cam has worked in such diverse states as Texas, Delaware, Maryland, New Hampshire, West Virginia, Colorado, Michigan, Pennsylvania, New York, Indiana, and Ohio.

Some of the state-level entities she has worked with include the MiHIN Resource Center in Michigan, West Virginia Health Information Network, and the Colorado Regional Health Information Organization. She works with a major state-level foundation to help refine HIE/HIT funding strategy to align HIE, provider EHR adoption, telehealth, workflow transformation, and quality initiatives. Cam has also worked with many community-level initiatives including the handful of financially self-sustaining health information exchanges in the country such as Michiana Health Information Network (MHIN) in South Bend, Indiana, and HealthBridge in Cincinnati, Ohio. She served as the Interim Executive Director of ICareConnect, Inc., a regional health information network in Central Indiana that merged into Indiana Health Information Exchange. Cam was also the Interim Executive Director of Collaborating Communities Health Information Exchange in Springfield, Ohio during its start-up period.

At the national level, Cam has been a Senior Scholar with Summit Health Institute for Research and Education in Maryland and Washington DC; founding board member at Better Healthcare for Indiana; a member of Healthcare Information and Management Systems Society (HIMSS), having served on the HIE Steering Committee; and eHealth Initiative. Most recently, she was on the Faculty at the National Governor’s Association Learning Forum for state-level HIEs in coordination with the Office of the National Coordinator (ONC). Camilla received a BA in Anthropology from the University of Illinois and a MBA from the University of New Mexico.
Ms. Reeser is Founder and Managing Principal of New Heights Consulting, LLC. She is an accomplished healthcare IT professional with more than 30 years of progressive multi-disciplinary healthcare management and consulting experience in a variety of healthcare information system settings, including health information exchanges, government agencies, large prime integration companies, large multi-state healthcare organizations, community hospitals, behavioral health institutions, and long-term care facilities.

Her professional accomplishments encompass executive education, information system and health information exchange strategic and operational plan development, health information exchange interim executive duties, information systems department assessment and restructuring, vendor evaluation and selection, contract negotiations, project management and system implementation. She has been very involved in the West Virginia Health Information Network where she assisted in the development of their HIE Strategic and Operational Plans and served as the interim Chief Information Officer. She has assisted the state of Maryland on numerous HIE projects.

Ms. Reeser education includes a Master of Business with a concentration in Finance from Temple University, and Bachelor of Science in Health Planning and Administration from the Pennsylvania State University. She is a member of PAeHI, the American College of Healthcare Executives (ACHE), Senior Member in the Healthcare Information Systems and Management Society (HIMSS) and President for the Maryland HIMSS chapter. Ms. Reeser has presented at local and national HIMSS events.
Barbara K. Burke, EdD

Barbara brings over twenty-five years of experience in healthcare management and project development and implementation.

Barbara served as the Community Project Lead to ICareConnect which merged into Indiana Health Information Exchange. In that capacity she worked with multiple stakeholders including physicians, hospital executives, CIOs, financial analysts, legal teams, and privacy officers to craft agreements around the exchange of data across organizations. At Michiana Health Information Network (MHIN) she worked with physician practices, hospitals, and the regional medical laboratory to do market studies of the medical referral region, physician practice workflow and ROI studies. This research served as the background for expanding stakeholder involvement in MHIN, increasing physician participation in the HIE, and developing a financially self-sustaining business model. She most recently provided market research and stake holder development to the business plan for the Colorado Regional Health Information Organization (CORHIO).

Prior to her work at SFT, Barbara directed and oversaw the development and integration of all Outpatient Health Care Centers, Occupational Health Clinics, Homecare and Wellness Services at St. Vincent Hospitals and Health Services in Indianapolis, Indiana. In her last three years at St. Vincent she was Director of Business Development and was responsible for the creation and implementation of a call center, strategic plans and land acquisition and development for outpatient facilities.

Barbara received her Master’s Degree from the University of Notre Dame and her doctorate from Indiana University.