Metropolitan Portland Health Information Exchange
Business Plan 2.0

Results and Reports Retrieval System

Last Updated: 10/31/2007 10:58 AM

Contacts:

Densie Honzel, Oregon Business Council Consultant, honzelde@aol.com

Nancy Clarke, Oregon Health Care Quality Corporation Executive Director, nancy.clarke@Q-Corp.org

Metropolitan Portland Health Information Exchange
Business Plan 2.0
Results and Reports Retrieval System

Last Updated 5/18/2007

EXECUTIVE SUMMARY

MPHIE Vision and Focus
The vision for the Mobilization Planning effort commissioned by the Oregon Business Council (OBC) Data Exchange Group is that:

> ***Meaningful health information is widely and securely available among authorized providers in a usable form anytime and anywhere it is needed in order to improve the overall safety, effectiveness, and efficiency of an individual's care and the public's health.***

The initial focus for the Metropolitan Portland Health Information Exchange (MPHIE) MPHIE is the Results and Reports Retrieval Project that will allow physicians and other clinicians to easily access and retrieve information they need to care for patients from other provider organizations including discharge summaries, emergency department summaries, laboratory results, and imaging reports. Other readily available electronic results and/or reports could be added as available.

Community Savings
The MPHIE results and reports retrieval functions are projected to result in significant community savings over time. Potential annual savings (eventually in ten years or more) are estimated to be in excess of $20 million, with over $12 million per year achievable within five years. Over half the savings are due to impact that more readily accessible information has on avoiding visits and tests, improving physician productivity and minimizing time lost from work for avoidable visits and tests. The other savings are due to reduced inefficiencies in manual and paper processing. Savings from avoidable services are a benefit patients, payers and employers. Savings from reducing inefficiencies are a benefit to physicians, other providers, payers and patients. Over six years the results and reports retrieval service is projected to yield total cumulative community savings of $47.8 million.

Results and Reports Retrieval Costs and Financing
The operating costs for MPHIE results and reports retrieval service are estimated at $3.4 million per year or $20.4 million over six years. Over six years the community would derive a net cumulative benefit of $27.4 million after operating costs.

Unfortunately the savings and benefits from the results and reports retrieval service cannot be translated into revenue sources to finance the development and operations of the MPHIE. The improvements in the delivery of care and the resulting savings represent community-wide benefits. The most practical approach to financing the results and reports retrieval service is also on a community-wide basis.

This plan proposes that the participating stakeholders will be the source of startup financing to cover the MPHIE operating costs for the results and reports retrieval service of

$3.4 million per year. The participants should be prepared and committed to supporting the results and reports retrieval service for five years. During year three, the MPHIE governing body, should undertake an evaluation of progress, achievement of the goals and objectives, and make appropriate changes in scope or direction of the exchange.

It is critical to secure programmatic and financial commitments from both health plans (insurers, fully capitated health plans (FCHPs), self-insurers) and health systems. It seems unlikely that financial commitments could be obtained from participating physicians to support the results and reports retrieval services.

Until the MPHIE organization is formally established with committed financing for a core service, it is not feasible to seriously pursue government grants, foundation or other support, or major collaborations such as the Medicaid Transformation initiative or the Oregon Public Reporting of Quality Measures (in connection with the Robert Wood Johnson Foundation's Aligning Forces for Quality initiative).

Long Term Financing

Based on experiences at other health information exchanges, the MPHIE should be capable of becoming a financially self-supporting enterprise based on service revenues. Other health information exchanges are providing a broader array of services and revenue streams to support their operations. Developing value-based services with associated revenue streams requires an expansion of capabilities beyond the results and reports retrieval functions.

Achieving self-sufficiency without long-term broad-based community financing will depend on how quickly an expanded scope of services could be pursued. Even so, the initial four to six years of MPHIE operations will likely require some level of broad-based community-wide support before it can become fully self-sustaining. With a commitment to a broader range of services, the total community-wide support required for the MPHIE over the four to six years could be $12 to 15 million.

Governance and Accountability

The MPHIE will have a governance model that is based on multi-stakeholder, mission-driven leadership, and respected by the community. The legal entity for the MPHIE will be an Oregon non-profit tax-exempt 501(c)(3) corporation with the sole initial mission to implement the MPHIE services. The governance plan for the MPHIE contemplates establishment of a Founders Council and Board of Directors. Founders Council members represent the organizations providing funding for the MPHIE. The Council is responsible for appointing the Board and for approving any changes to MPHIE bylaws. The Board will consist of ten directors with two directors representing five stakeholders groups (health plans, hospitals/delivery systems, physicians, purchasers, consumers). The Board is responsible for establishing MPHIE policies, oversight of the implementation plans and operations, and evaluating MPHIE programs. The Board will keep the Founders Council and organizations funding MPHIE activities informed regarding the progress and evaluation of the results and reports retrieval services.

MPHIE evaluation metrics are proposed to monitor progress as it matures. Given the limited scope of the initial project, success metrics are tailored to each stage of the project, including:

- Operational and Implementation (Years 1-2)
- Workflow (Years 2-5)
- Clinical Usefulness (Years 2-5)
- Overall Success (Years 5+)

The Board of Directors and Founders Council will need sufficient data and clarity about the operations and outcomes of the MPHIE project to substantiate the value of the continued funding commitments over the lifetime of the project.

Risks

As with any transformational project or enterprise, there are risks with the Metropolitan Portland HIE project. The decision to keep the first step limited in scope in order to reduce financial exposure introduces several risks:

- Physician uptake and utilization may be slower because of more limited utility.
- Consumer concerns relating to protecting their privacy may result in too few participants to be a useful system.
- Savings and overall community benefit may be delayed.
- Adding expanded functionality later may cost more as a result of earlier technology decisions.

The mobilization workbook that accompanies this report proposes recommended strategies for anticipating and mitigating these risks. Continued attention from the Board will assure sound decision-making to assure the success of the system.

Consumer Access to the HIE: *The plan for engaging consumers with the MPHIE is quite limited at initial start-up. As proposed, patients will have access to and manage their information through a participating provider.*

> *Emerging community expectations and industry standards regarding consumer access are making it possible and advisable to move quickly to engage patients in a more direct manner. Failure to do so could results in:*
>
> - *missed opportunities to help consumers improve their health*
> - *sizable numbers exercising their option to decline to participate, resulting in too small a system to be useful to providers*
> - *a small but effective minority legally prohibiting the exchange from functioning.*
>
> *As the MPHIE is implemented, the leadership will need a transparent and nimble plan for addressing the relationship between the exchange, consumers, and the emerging proliferation of personal health records (PHRs). This plan will need to move quickly toward a model that responsibly allows patients to:*

- *view their clinic records in the exchange*
- *know who accessed their records through the exchange*
- *know where exchange information about them is kept*
- *manage their participation options*

Another serious risk to the success of the MPHIE arises from the need for significant, ongoing leadership and commitment from the participating organizations.

- If one or more of the community participants declines or terminates participation, there will be a significant threat to the usefulness and viability of the HIE.
- If participation is only half-hearted, without the serious commitment to keeping a federated system functioning and integrated within an organization's internal systems, the system will fail.

Mitigating these risks will require continued committed leadership by the project champions and stakeholders.

There are clearly risks of doing nothing to improve the availability of meaningful health information.

- Risks to quality and safety, including deaths and injuries due to lack of key information across settings;
- Ever-higher cost of providing care;

The current "silos" of data will become more entrenched.

RESULTS & REPORTS RETRIEVAL SERVICE

Health Information: the Problem, the Need, and the Vision

In Portland Oregon USA, in the year 2007, a patient's health information is:

- Scattered across different hospitals, labs, physician offices, and many other care settings;
- Inaccessible to the patient and other providers who may need it in different care settings;
- Incomplete, fragmented, and difficult to aggregate.

As a result, information needed by physicians to care for their patients is often not available at the point and time of care when it is needed most. The real impact on our region is that:

- The cost of providing care is higher;
- The overall quality of our care is lower;
- There could be unnecessary deaths in our community as the results of disparate pockets of medical information for a given patient.

The members of the Oregon Business Council (OBC) Data Exchange Group have provided initial leadership and vision on encouraging the exchange of health information among different providers and locations of care. The OBC's vision is:

> *Meaningful health information is widely and securely available among authorized persons in a usable form anytime and anywhere it is needed in order to improve the overall safety, effectiveness and efficiency of an individual's care and the public's health.*

Physicians and patients know that on a daily basis, there is a gap between this vision and the reality of patient care in every hospital, every physician office, and practically every other care setting.

Who would be helped by Metropolitan Portland HIE?

The patient who spent two extra days in the hospital because the hospitalists did not have records from elsewhere indicating his renal insufficiency was chronic rather than acute. The 64 year old woman with an enlarged thyroid that got a completely redundant work-up for Hashimoto's thyroiditis while we were waiting for her old records.

The 37 year old Hispanic woman who got the exact same series of tests at 3 different institutions instead of getting what she really needed -- which was a surgeon to remove her inflamed gallbladder.

The 48 year old man who ended up in the cath lab getting a coronary angiogram because an old ECG wasn't available for comparison.

The 53 year old woman who spent 2 weeks in fear that she had cancer until we finally got her old chest xray -- which showed that the spot we found on xray was exactly the same 4 years ago.

Nationwide and in the Metropolitan Portland region, there is increasing recognition that real leadership, strong community collaboration, commitments of funding, provider enthusiasm, and application of the best and most cost-effective technology are required to solve the problems of healthcare information exchange.

We have reached a "tipping point" in the Portland metropolitan area; the senior leaders of healthcare systems and health plans recognize the many benefits of health information exchange, to improve the health of the community and their own patients. With the OBC's healthcare data exchange initiative, there is an opportunity to make real progress in the region to:

- Improve the availability of critical information for every patient in any care setting;
- Lower the cost of providing care while increasing efficiency;
- Improving patient and physician satisfaction with the care process;
- Increase the overall quality and safety of care provided in Portland.

What is the Metropolitan Portland HIE?

The Metropolitan Portland Health Information Exchange (MPHIE) is first and foremost **a collaboration between health care providers and health plans to switch paper and fax exchange to 21st century technology.** It is a method to electronically move personal health and medical information securely between doctors, hospitals and other healthcare providers when it is needed for a patient's care. This project is a first step to determine whether we can be successful in exchanging information in a way that is useful to clinicians.

In 2006, the OBC identified a starting point for the MPHIE that would take advantage of current systems and data in the Portland area, to demonstrate an initial success. The decision was to build a results and reports system to display historical data to non-ordering providers.

- The system would take advantage of existing data;
- The results are useful and clinically relevant;
- The selected project offers a short path to a net potential community savings.

The starting point will also lay a foundation that could be expanded in various ways in the future.

The MPHIE will be cost effective to build and maintain. It will foster the trust of the community by having a core emphasis on the security and privacy of patient information. Some other characteristics of the MPHIE are:

- Simple to use;
- Targeted in scope;
- Easily deployed, updated, and expanded;
- Compatible with national healthcare information standards.

Who would use the MPHIE, and why?

The principal users of the MPHIE are physicians and their clinical staff. The MPHIE will permit authorized providers to access the right medical information at the right time, for example ensure that healthcare providers have the critical life-saving information they need in times of emergency. Physicians will have more complete information at the point of care for more informed treatment decisions on individual patients that participate in the exchange. They will spend less time tracking results and reports from other locations, less time taking repeated patient histories, and more time engaged in the productive activities related to patent care. Healthcare providers must have the critical life-saving information they need in times of emergency.

How will the MPHIE operate?

Data and Technology Services: Most providers of healthcare in the Portland have a significant amount of patient data managed by computers. They also have systems to move data within their enterprises, and with selected partners. Starting with these building blocks already in place, **the MPHIE can relatively cheaply and easily add consistency and efficiency to data sharing between health systems and physicians** that will improve patient care:

- Patient registration and demographic data;
- Laboratory results;
- Imaging reports;
- Dictated summaries from hospitalizations;
- Dictated summaries from the emergency department (ED);
- Other readily available e-data.

A lightweight set of centralized data exchange services will allow the MPHIE to foster access to patient information by authorized providers. The centralized services include:

- Patient identity management;
- Record location services;
- User authorization, authentication and access control;
- Audit trails.

Under the planned federated model for the infrastructure there is no requirement for a large central database to aggregate patient information; rather, participants maintain data stores inside their own organizations, which are queried via the exchange by authorized providers.

Outsourcing Strategy: There are several vendors who can provide the technology and implementation services required, including those with working solutions in communities similar to Portland. The MPHIE will leverage current technology, existing infrastructure, and proven methods for developing a federated system using standards for interoperability. The MPHIE services will be hosted as an application service provider (ASP) for the community. This means that **the MPHIE does not need to build its own data center and technology operations, and it can achieve the OBC's aims at a substantially lower cost** than some other communities achieved previously.

Metropolitan Portland Health Care Environment

The Tri-County Area including Clackamas, Multnomah, and Washington Counties is the initial focus of the MPHIE. The Tri-County area encompasses about 1.6 million lives, nearly 4,000 physicians, and twelve hospitals. Nine of the hospitals are part of four large health systems: Kaiser Permanente, Legacy Health System, Oregon Health & Science University and Providence Health System. Clark County, Washington is also part of the Portland-Vancouver Standard Metropolitan Statistical Area and part of the Portland metropolitan economic markets and health care community. Implementing the MPHIE initially within the Tri-County area is planned to keep the project narrow and focused as well as avoid dealing with health privacy laws and regulations from two states.

The health care market environment of the Tri-County Area is detailed in a companion document titled Metropolitan Portland Area Health Care Environment, Updated February 20, 2007. The latest environment document can be accessed at http://www.q-corp.org/default.asp?id=13.

Improved Care and Community Savings

Community Value Propositions

The MPHIE reports and results retrieval project will result in substantial qualitative improvements in health care delivery to patients and provide benefits to physician

practices, hospitals, laboratories and imaging practices, health plans, purchasers and employers. The value propositions to these various groups are:

Value to Patients

- Clinicians have prompt access to data they need for my care
- Fewer delays; fewer visits, laboratory tests, imaging studies
- Better coordination of my care
- Better relationship with my clinicians
- Not paying for avoidable services
- Less time lost from work and family
- Less frustration providing information again and again

Value to Physician Practices

- Prompt access to information from other providers
- Better clinical decisions and care with access to more complete data
- Provide care with fewer delays
- Avoid rework - repeating taking of histories
- Better access to current mediations lists
- Less time collecting or getting information, more time using available information
- Office productivity tracking down information
- Lower processing costs, eventual integration of external data into EHR
- Less liability risk exposure with improved information access

Value to Hospitals

- Prompt access to info from other providers
- ED productivity/through-put
- Minimize unnecessary/avoidable services
- Financing uninsured avoidable services
- Lower information processing/distribution costs, especially non-routine requests
- Eventual capability to use the MPHIE for report distribution functions instead of building new interfaces.

Value to Laboratories and Imaging Centers

- Prompt access to information from other providers
- Lower information processing/distribution costs, especially non-routine requests
- Eventual capability to use the MPHIE for report distribution functions instead of building new interfaces.

Value to Health Plans

- Lower claims on avoided services
- Improve health care system productivity
- Eventually using clinical data for quality reporting, pay-for-performance

Value to Employers / Purchasers

- Less time-loss due to avoided services

Drive out unnecessary service costs
Improve health care system productivity
Eventually using clinical data for quality reporting, pay-for-performance

In summary the MPHIE results and reports retrieval project provides

- **Substantial overall community savings achievable within a few years**
- Savings from reducing inefficiencies are a benefit to physicians, other providers, payers & patients
- Savings from avoidable services are a benefit patients & payers.

It should however be noted that the savings from avoidable services are a loss of revenues to the organizations and practices that would have provided those services.

Benefits Analysis and Community Savings

The MPHIE results and reports retrieval functions are projected to result in significant community savings over time. Potential annual savings eventually achievable (ten years or more) are estimated to be in excess of $20 million per year with over $12 million per year achievable within five years.

The source of savings related to results and reports retrieval project include:

- Avoidable ambulatory visits, laboratory tests and imaging studies
- Avoidable emergency department laboratory tests, imaging studies and hospital admissions
- Processing savings – less paper-based processing and labor in distributing information
- Physician rework – multiple or repeated history taking
- Physician/staff productivity – unsuccessful looking for information
- Employer time-loss saving for avoided services

POTENTIAL Savings: Total POTENTIAL Savings (eventually achievable) are currently estimated at over $20 million per year, as follows:

Avoided services	$8.8 million
Routine paper processing	0.2 million
Non-routine paper processing	5.4 million
Physician productivity	4.1 million
Practice office productivity	1.7 million
Avoided time-loss	1.2 million
Total Savings	**$21.4 million**

Potential avoided visits, laboratory and imaging test savings of $8.8 million per year primarily accrue to the various payers which include primary health plan coverage, secondary coverage and patients. Payers also include hospitals, physicians, community clinics and other providers that absorb the costs of caring for many uninsured patients. A

distribution of the avoidable services savings by the primary payer category is shown in the following table.

Avoided Services Savings By Primary Payer Type	Estimated Expense Exposure	Potential Annual Savings
Uninsured (mostly providers, some patient pay)	8.2%	$ 722,000
Medicare	17.2%	1,514,000
OHP, Medicaid, CHIP, etc via FCHP	7.1%	625,000
OHP, Medicaid, CHIP, etc via FFS, other	1.2%	106,000
Oregon Domestic Insurers (13 plans)	45.6%	4,013,000
Largest Reportable Foreign Insurers (10 plans)	7.0%	616,000
Other Reportable Foreign Insurers (92 plans)	0.5%	44,000
Self-insured plans	13.2%	1,162,000
Oregon Veterans Population (data not available)	NA	NA
Total Avoided Service Savings	100.0%	$ 8,800,000

Table notes:

- Medicare Advantage patients are included with insurance plans since the risk is borne by plans not Medicare.
- Fully Capitated Health Plans (FCHP) bear the risk for most of the Oregon Health Plan/Medicaid patients.

Reduced inefficiencies result in savings to the various organizations or practices that are able to access, distribute and process information with fewer manual and/or paper processes. The distribution of reduced inefficiency savings among the affected organization categories is shown in the following table.

Reduced Inefficiencies	Potential Annual Savings
Processing Savings - Health Systems	$ 532,000
Processing Savings - Free Standing Entities	102,000
Processing Savings - Physician Practices #	4,737,000
Processing Savings - Payers	140,000
Physician/staff Productivity Loss Seeking Info #	1,741,000
Physician Productivity - Repeated Histories #	4,112,000
Employer Time-loss/Staffing Savings on Avoided Services	1,249,000
Total Reduced Inefficiencies Savings	$12,613,000

Includes hospital/health system practices, clinics and emergency departments.

Community Savings Realization Projections

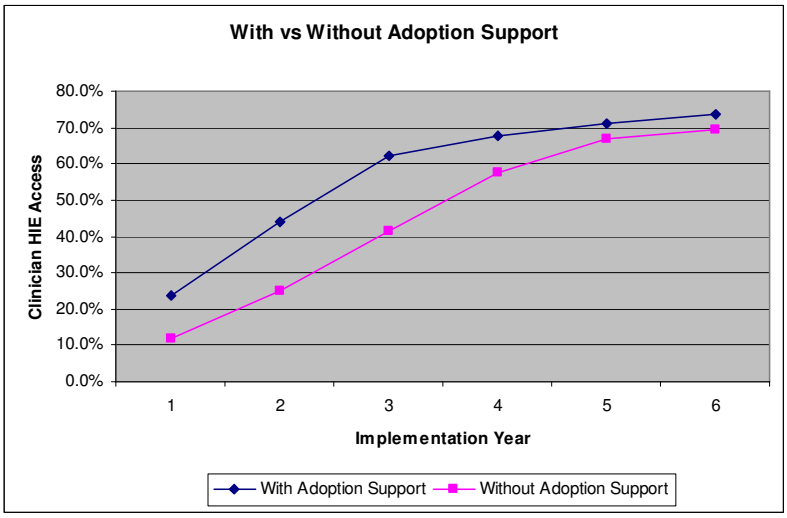
Expected Participation: The operating plan for the MPHIE assumes that Kaiser, Legacy, OHSU and Providence health systems would all become active participants in the MPHIE during the first operational year, including their health systems clinician practices, laboratories, imaging centers and hospitals. Actual participation during the first year may be phased for the convenience of the MPHIE and the health systems. OCHIN (serving the safety-net clinics) and four large clinician practices with electronic medical records systems are projected to start participation in year 1. Other hospitals, laboratories, imaging centers and clinician practices are expected to begin their MPHIE on a phased basis over the first several years of operation of the MPHIE.

Community savings are estimated under two scenarios. First, adoption and the consequent savings realizations are estimated assuming minimal encouragement and support for adoption by clinicians – the "Without Adoption Support" scenario. Second, adoption and consequent savings are estimated assuming an active adoption support program as reflected in the cost estimates for the MPHIE and health systems – the "With Adoption Support" scenario.

Ninety percent of projected savings from avoided services are expected to be related to care provided by clinicians in selected specialties. Target specialties for the MPHIE are primary care, medical specialties, pediatrics and specialties, obstetrics/gynecology, emergency medicine and hospitalists. The Tri-County area includes 2,687 clinicians in the target specialties including physicians (MDs and DOs) as well as nurse practitioners and physician assistant clinicians (NPs, PAs, CNMs).

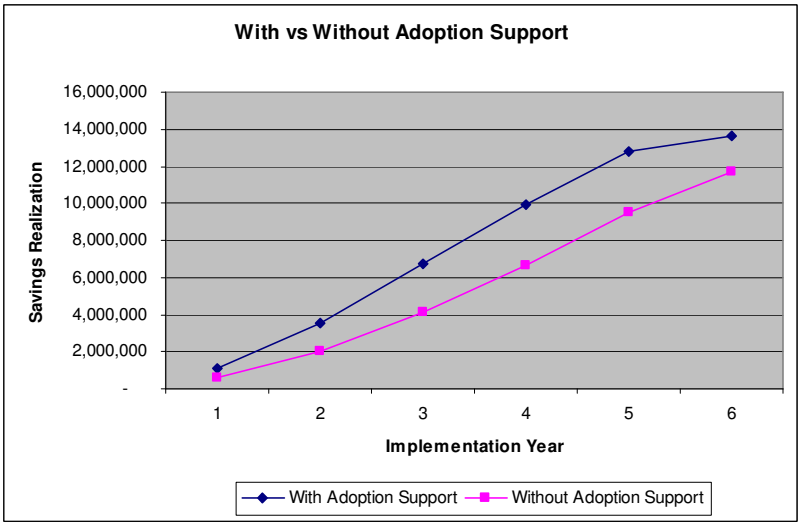
Total clinician participation from the targeted specialties is reflected in the following graph under the With and Without Adoption Support scenarios.

Target Clinician HIE Access



Total community saving realized under the with and without adoption support scenarios is shown in the following graph.

Savings Realization



With Adoption Support: Under the With Adoption Support scenario the net realized savings for the community are reflected in the following table. In the With Adoption Support scenario $200,000 is budgeted for adoption support in each year.

Annual Net Realized Savings – With Adoption Support (in $ millions)

REALIZED SAVINGS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Avoidable Services	0.4	1.3	2.6	3.8	5.0	5.4
Reduced Inefficiencies	0.7	2.2	4.2	6.1	7.8	8.3
Total	1.1	3.5	6.8	9.9	12.8	13.7
OPERATING COSTS	3.4	3.4	3.4	3.4	3.4	3.4
NET REALIZED SAVINGS	-2.3	0.1	3.4	6.5	9.4	10.3

Cumulative Net Realized Savings – With Adoption Support (in $ millions)

REALIZED SAVINGS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Avoidable Services	0.4	1.7	4.3	8.1	13.1	18.5
Reduced Inefficiencies	0.7	2.9	7.1	13.2	21.0	29.3
Total	1.1	4.6	11.4	21.3	34.1	47.8
OPERATING COSTS	3.4	6.8	10.2	13.6	17.0	20.4
NET REALIZED SAVINGS	-2.3	-2.2	1.2	7.7	17.1	27.4

Under the With Adoption Support scenario, realized savings cover operating costs in year 2, with a cumulative net savings breakeven achieved in year 3. Total annual realized savings in excess of $12 million are achieved in year 5 with an adoption support program.

Without Adoption Support: Under the Without Adoption Support scenario the net realized savings for the community are reflected in the following table. In the Without Adoption Support scenario nothing is budgeted for adoption support in each year.

Annual Net Realized Savings – Without Adoption Support (in $ millions)

REALIZED SAVINGS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Avoidable Services	0.2	0.6	1.4	2.3	3.5	4.5
Reduced Inefficiencies	0.4	1.4	2.7	4.3	6.0	7.2
Total	0.6	2	4.1	6.6	9.5	11.7
OPERATING COSTS	3.2	3.2	3.2	3.2	3.2	3.2
NET REALIZED SAVINGS	-2.6	-1.2	0.9	3.4	6.3	8.5

Cumulative Net Realized Savings – Without Adoption Support (in $ millions)

REALIZED SAVINGS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Avoidable Services	0.2	0.8	2.2	4.5	8.0	12.5
Reduced Inefficiencies	0.4	1.8	4.5	8.8	14.8	22.0
Total	0.6	2.6	6.7	13.3	22.8	34.5
OPERATING COSTS	3.2	6.4	9.6	12.8	16.0	19.2
NET REALIZED SAVINGS	-2.6	-3.8	-2.9	0.5	6.8	15.3

Under the Without Adoption Support scenario, realized savings cover operating costs in year 3, with a cumulative net savings breakeven achieved in year 4. Total savings in excess of $9 million are achieved in year 5 with Without Adoption Support.

These net realized saving calculations do not include the in-kind and other costs that would be incurred by the health systems and other data providers. In aggregate, the in-kind and other costs of all the various organizations participating in the MPHIE are probably around $1 million per year.

Cumulative Community Savings: MPHIE operating costs are currently estimated at $3.4 million per year under the With Adoption Support scenario for a six year total cost of $20.4 million. Over the six year period the community would derive $47.8 million of savings or $27.4 million after MPHIE operating costs. Assuming $1 million per year in in-kind and other costs of the participating health systems, the net saving to the community over the six years would be $21.4 million.

Caveats About Community Savings: The community savings identified are estimates of benefits that can be achieved by implementing the MPHIE to provide results and reports retrieval. The goal is to improve clinical care in the community, avoid the provision of unnecessary or duplicative services and reduce inefficiencies in providing clinical care. Avoidable service savings will be reflected in reduced service billings to health plans and patients. The productivity improvements from reduced inefficiencies are more difficult to measure and indeed may be difficult to capture as reduced operating costs for some providers. Measuring both direct and overall savings could prove difficult given that other changes in the health care delivery system may obscure the results.

Costs and Financing

Establishing the MPHIE and undertaking the results and reports retrieval project will require both start-up and ongoing financing. Significant resources have already been committed to the start-up efforts and planning through the OBC Data Exchange Group's support of the options investigation and the Mobilization Planning including this business plan. The planned technology approach, system architecture and ASP contracted services model minimizes the need for major start-up financing commitments. It therefore appears that the remaining start-up costs can be incorporated within the first year operational costs.

Operating Costs

Based on this federated system architecture, cost estimates were solicited from four vendors for operation of the MPHIE as an ASP model. Key findings from the process are that the HIE exchange: operations and the ASP vendor contract would represent:

- Approximately $3 million/year based on information from 4 vendors based on retail pricing
- Small central MPHIE staff of 3-4 positions to support leadership, participant coordination, contract management functions.

The Mobilization Planning identified two additional financing requirements to maximize the success of the MPHIE that would not be covered by the ASP vendor contract and small central MPHIE staff. First, consumer trust and confidence regarding the privacy of their information is a sensitive issue that will require some dedicated resources for brochure development and technical assistance to participating organization. Consumer engagement support is budgeted at $200,000 per year. Second, achieving the expected savings will be affected by the level of effort committed to supporting clinicians and participating organizations in the training of personnel to take advantage of the MPHIE resources. Adoption support including education and training program development and technical assistance is budgeted at $200,000 per year.

Total MPHIE costs for the results and reports retrieval services are projected at about $3.4 million per year. The expected costs are detailed in Appendix C: MPHIE Architecture and Operating Costs. The proposed budget is based on a central MPHIE staff of 4.00 full-time-equivalent (FTE) employees and 0.25 FTE in contracted services for a chief medical officer (CMO) that would serve as the primary liaison to practicing physicians. In rough terms the $3.4 million per year budget represents:

MPHIE staffing and operations	$ 600,000
ASP services contract	2,400,000
Consumer engagement	200,000
Adoption support	200,000
Total annual budget for planning purposes	$3,400,000

The budget estimated for the ASP services contracted is based on discussions with vendors that seem to meet MPHIE service needs that would be expected to respond to a request for proposal (RFP). The RFP process will result much more definite costs. It would not be unreasonable to expect that the costs negotiated with the successful vendor would be less than the preliminary costs estimates. Ongoing cost in subsequent years may also be quite different than the first year implementation costs. The MPHIE implementation plan contemplates adding organizations and physician practices on a phased basis over several years. Therefore it seems prudent to estimate ASP contract costs at $2.4 million per year for purposes of forecasting the potential financing requirements.

Impact on Participating Organizations: The Mobilization Planning also considered the impact that the results and reports viewing project would have on the participating organization. The major participating organizations are likely to incur participation-related costs as follows:

- Data Suppliers: hospitals, labs, imaging
    - Edge server, staff time to interface, monitor
- Clinical Users: hospitals, practices
    - Need champion clinician support
    - Inclusion of MPHIE access into training/orientation efforts
    - Workflow redesign to leverage HIE access and benefits
    - Eventual integration into local EHR systems

It is estimated that each of the major health systems will incur internal costs of about $100-150,000 per health system during the first several years of MPHIE operations. Other hospitals, commercial laboratories, imaging centers, and physician practices will incur some lower level of internal costs to support their MPHIE participation.

Financing Strategy: Results and Reports Retrieval

In addition it improving the quality of health care, the community savings represent an important rationale for development of the MPHIE results and reports retrieval project. However, the manner in which these savings will accrue for the results and report retrieval components cannot be readily transformed into revenues or revenue sources to support the MPHIE project.

There are a number of examples of financially self-sufficient health information exchanges around the United States as detailed in Appendix E. Financing at Other RHIOs/HIEs.

The initial project for the MPHIE results and reports retrieval project is quite narrow compared to services at self-sustaining HIEs, especially since results and reports retrieval is a different service and functionality than results and reports distribution. The Long Term Sustainability section below discusses revenue development opportunities with an expanded menu of services.

Community-Wide Financing

This plan proposes that the participating stakeholders provide the financing of the MPHIE operating costs for the results and reports retrieval service of $3.4 million per year. The participants should be prepared and committed to supporting the results and reports retrieval service for five years. During year three, the MPHIE governing body, should undertake an evaluation of progress, achievement of the goals and objectives, and make appropriate changes in scope or direction of the exchange.

It is critical to secure programmatic and financial commitments from both health plans (insurers, fully capitated health plans (FCHPs), self-insurers) and health systems. It seems

unlikely that financial commitments could be obtained from participating physicians to support the results and reports retrieval services.

Until the MPHIE organization is formally established with committed financing for a core service, it is not feasible to seriously pursue government grants, foundation or other support, or major collaborations such as the Medicaid Transformation initiative or the Oregon Public Reporting of Quality Measures (in connection with the Robert Wood Johnson Foundation's Aligning Forces for Quality initiative).

Financing Allocations

Determining the specific sources for obtaining the community-wide financing is a challenging problem. Appendix D. Financing Issues describes the complexities of the problem.

Key guiding principles in developing proposed financing allocations are:

- Financing should follow the flow of benefit to the extent possible.
- Community-wide funding distributions should be as fair and defensible as possible.

The overall benefit distribution for the results and reports retrieval system is about 70% to plans and employers and 30% to providers. Taking into account the internal in-kind costs that providers will incur to make their clinical information accessible to the exchange and access the exchange as clinical users, the adjusted benefit distribution is about 75% plans and 25% provider organizations. With the $3.4 million cost per year, the allocation would be $2.55 million to be financed from health plans and $850,000 financed from provider organizations.

A proposed allocation of funding among participating organizations could be based on:

- Health plans: covered lives in the plan in the Tri-County area.
- Hospital – health system providers: total organization expenses.

There is publicly available data to calculate the market shares of the health plans and provider organizations. Health plan data for insurance companies is available from the Oregon Insurance Division at http://www.cbs.state.or.us/ins/sehi/health-insurance_topresent-enrollment.html. Data on self-insured health plans is not readily available. Data on covered lives in self-insured health plans using participating insurance companies for third-party administration (TPA) services could be collected directly from those plans. Data on covered lives through the Oregon Health Plan (FCHPs, fee-for-service, or primary care case management programs) can be found at http://www.oregon.gov/DHS/healthplan/data_pubs/enrollment/main.shtml. Data on hospital - health system expenses reported to Office for Oregon Health Policy and Research can be found at http://www.oregon.gov/DAS/OHPPR/RSCH/databank.shtml

Perceptions of fairness may vary among the organizations that participate in the community-wide financing. In order for community-wide funding distribution to be fair and follow the flow of benefits principles, the market share-based allocations could be

adjusted to deal with differences between the organizations providing funding. Identified differences between funding organizations that should be considered include:

- Differences in the accrual of expected benefits between organizations.
- Avoiding double counting for the financing shares for organizations that operate both a health plan and provider services.
- Differences between provider systems in terms of the portion of their services provided to Tri-County vs. out-of-area populations.
- Limited financing capacity of fully capitated health plans (FCHPs).

Governance, Accountability and Risks

Governance

The MPHIE should have a governance model that is based on multi-stakeholder, mission-driven leadership, and respected by the community. The legal entity for the MPHIE should be an Oregon non-profit tax-exempt 501(c)(3) corporation with the sole initial mission to implement the MPHIE services. The governance plan for the MPHIE contemplates establishment of a Founders Council and Board of Directors. Founders Council members represent the organizations providing funding for the MPHIE. The Council is responsible for appointing the Board and for approving any changes to MPHIE bylaws. The Board will consist of ten directors with two directors representing five stakeholders groups (health plans, hospitals/delivery systems, physicians, purchasers, consumers). The Board is responsible for establishing MPHIE policies, oversight of the implementation plans and operations, and evaluating MPHIE programs. The Board will keep the Founders Council and organizations funding MPHIE informed regarding the progress and evaluation of the results and reports retrieval services. The governance structure for the MPHIE is more fully described in the MPHIE Final Report and MPHIE Governance Plan documents.

Accountability and Evaluation

MPHIE evaluation metrics are proposed to monitor progress as it matures. Given the limited scope of the initial project, success metrics are tailored to each stage of the project, including:

- Operational and Implementation (Years 1-2)
- Workflow (Years 2-5)
- Clinical Usefulness (Years 2-5)
- Overall Success (Years 5+)

Proposed evaluation metrics are outlined in Appendix F. Evaluation Metrics.

The Board of Directors and Founders Council will need sufficient data and clarity about the operations and outcomes of the MPHIE project to substantiate the value of the continued funding commitments over the lifetime of the project.

Risks

As with any transformational project or enterprise, there are risks with the Metropolitan Portland HIE project. The decision to keep the first step limited in scope in order to reduce financial exposure introduces several risks:

- Physician uptake and utilization may be slower because of more limited utility.
- Consumer concerns relating to protecting their privacy may result in too few participants to be a useful system.
- Savings and overall community benefit may be delayed.
- Adding expanded functionality later may cost more as a result of earlier technology decisions.

The mobilization workbook that accompanies this report proposes recommended strategies for anticipating and mitigating these risks. Continued attention from the Board will assure sound decision-making to assure the success of the system.

Consumer Access to the HIE: *The plan for engaging consumers with the MPHIE is quite limited at initial start-up. As proposed, patients will have access to and manage their information through a participating provider.*

> *Emerging community expectations and industry standards regarding consumer access are making it possible and advisable to move quickly to engage patients in a more direct manner. Failure to do so could results in:*
>
> - *missed opportunities to help consumers improve their health*
> - *sizable numbers exercising their option to decline to participate, resulting in too small a system to be useful to providers*
> - *a small but effective minority legally prohibiting the exchange from functioning.*
>
> *As the MPHIE is implemented, the leadership will need a transparent and nimble plan for addressing the relationship between the exchange, consumers, and the emerging proliferation of personal health records (PHRs). This plan will need to move quickly toward a model that responsibly allows patients to:*
>
> - *view their clinic records in the exchange*
> - *know who accessed their records through the exchange*
> - *know where exchange information about them is kept*
> - *manage their participation options*

Another serious risk to the success of the Metropolitan Portland HIE arises from the need for significant, ongoing leadership and commitment from the participating organizations.

- If one or more of the community participants declines or terminates participation, there will be a significant threat to the usefulness and viability of the HIE.
- If participation is only half-hearted, without the serious commitment to keeping a federated system functioning and integrated within an organization's internal systems, the system will fail.

Mitigating these risks will require continued committed leadership by the project champions and stakeholders.

There are clearly risks of doing nothing to improve the availability of meaningful health information.

- Risks to quality and safety, including deaths and injuries due to lack of key information across settings;
- Ever-higher cost of providing care;
- The current "silos" of data will become more entrenched.

Critical Success Factors

The MPHIE has a tremendous potential to improve and transform health care in the metropolitan Portland community by implementing the results and reports retrieval system. Significant community-wide savings can be generated beyond the costs of operating the services. The success of the MPHIE will be critically dependent on at least the following:

- The major funders must be willing to commit the resources to cover the core MPHIE costs for results and reports retrieval service for at least five years, approximately $17 million.
- The major health systems (essential data providers and users) must be prepared to commit the necessary internal resources to
  - Implement or interface their systems to make data available,
  - Train and encourage their staff to use the HIE,
  - Manage participation of patients from within their health systems.
- Community physician practices and health systems access and use the MPHIE to obtain readily available clinical information to facilitate the care of their patients.

LONG TERM SUSTAINABILITY

Self-Sufficient Sustainability Goal

The results and reports retrieval system project provides the opportunity to establish the core MPHIE operations, better serve clinicians and patients, generate community-wide savings, develop the working relationships across the community and evaluate the success of the collaborations. The scope of the MPHIE could be permanently limited to the results and reports retrieval functions if (a) the funders/sponsors remain content with an ongoing financing allocation mechanism and (b) other programmatic roles for the MPHIE are not worthy of pursuit.

If a longer term goal is to make the MPHIE financially self-sufficient with something other than a community-wide financing allocation system, then the MPHIE will need to consider financing models used by other self-sustaining HIEs/RHIOs

Achieving self-sufficiency without long-term broad-based community financing will depend on how quickly an expanded scope of services could be pursued. Even so, the initial four to six years of MPHIE operations will likely require some level of broad-based community-wide support before it can become fully self-sustaining. With a commitment to a broader range of services, the total community-wide support required for the MPHIE over the four to six years could be $12 to 15 million.

Potential Revenue Sources

As noted above, the community savings benefits from the results and reports retrieval services are not revenues or revenue sources that can be readily transformed to support the establishment or operations of a financially self-supporting and self-sustaining MPHIE. The initial project for the MPHIE results and reports retrieval project is quite narrow compared to services at self-sustaining HIEs, especially since results retrieval is a different service and functionality than results distribution.

There are examples of financially self-sufficient HIEs / RHIOs around the United States including the Utah Health Information Network (claims processing), HealthBridge in Cincinnati (results distribution), Indiana Health Information Exchange (research network pooling clinical data involving into results distribution), Taconic RHIO, NY (physician EHRs and feeding data to EHRs). See Appendix E. Financing at Other RHIOs/HIEs for additional information.

Services offered at other HIEs include:

- Claims/payment transactions, related services
- Coverage & eligibility verification
- Lab results distribution
- Clinical data access & retrieval
- Common interfaces to physician EHRs
- Messaging & referral between physicians

- Quality reports to plans & purchasers
- Physician practice quality reporting & data

Long-term revenues sources at other self-sustaining HIEs include:

- Result/report distribution fees
- Subscription fees to access services
- Claims & related transaction fees
- A la carte fees for data or reports
- Member participation fees

The options for developing MPHIE ongoing financing revenues include:

- Membership fees - participation subscriptions: purchasers, health plans, health systems, IPAs, (physicians, patients)
- Service subscriptions: service bundles(s)
- Transaction processing fees: distribute results, eligibility/claims info, feed PHRs

In considering the feasibility of developing self-sustaining revenues for the MPHIE it is useful to apply example fees and services revenues from other HIE to the MPHIE. Development of comparable revenue sources could result in the following revenue streams for the MPHIE:

- Results distribution: 4 million reports x $0.35 = $1.4 million/year
- HIE Data access subscription (w/EHR data feed): $500/yr/clinician (discounts by practice size) x 4,000 = $1.5 million/year
- Quality reports to plans/purchasers: $0.50 PMPM x 700K lives = $4.2 million/year
- Quality data feed subscriptions to practices: $2,500/yr x 100 practices = $250K/year

Developing transactional or other service revenues based on the initial and narrow focus of the results and reporting project is exceedingly difficult if not impossible. Developing transactional and services revenues on top of the results and reports project once the MPHIE is operational seems realistic based on the experience of other HIEs.

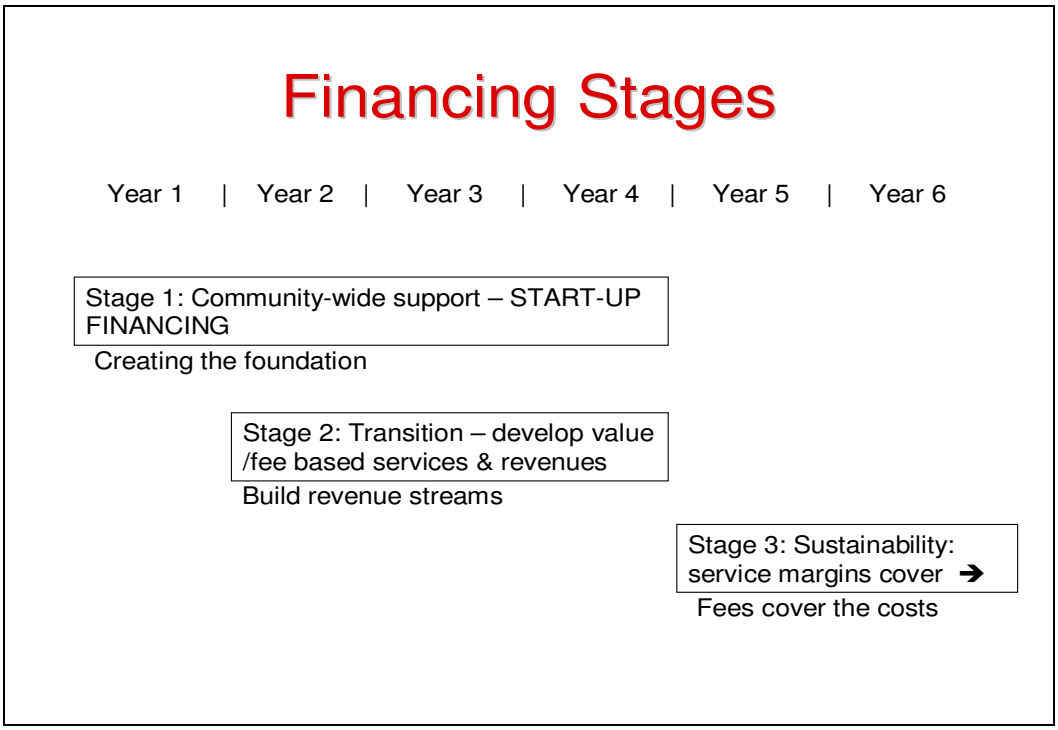
Long Term Financing Strategy

A long term financing construct for the MPHIE is outlined in the following Gantt chart.

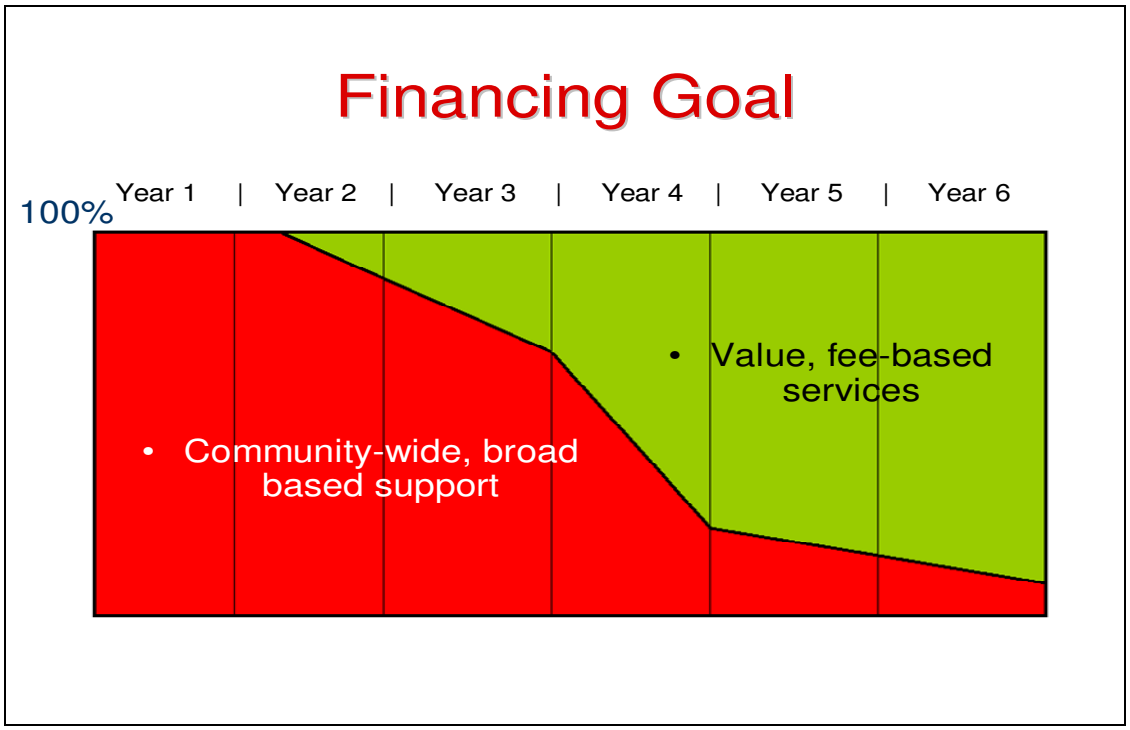
Stage 1 relies on broad-based community support to establish the MPHIE, implement the **results and reports retrieval services** to improve clinician access to information about their patients and begin achieving the expected improvements in clinical care and saving.

During Stage 2, the process of developing transactional and other value-based services is initiated. Additional services are offered by the MPHIE that can generate revenues and further the programmatic goal of improving clinical care.

By Stage 3, the development of transactional, value-based subscription and other services has developed to make the MPHIE financially self-sufficient.



The financing goal of self-sufficiency and declining need for community-wide, broad-based support for the MPHIE is depicted in the following graph.



Services Focus by Stages: The nature of MPHIE services during the three stages includes:
Stage 1: Community-wide benefit services

- Improve clinical care (**results/reports retrieval & viewing**, e-clinical data access)

Stage 2: Value/fee-based services (transitioning)

- Improve clinical care (report distribution, disease mgmt, PH reporting, immunization system integration, provider quality mgmt)
- Efficiency-based services (complex case mgmt, chronic disease mgmt, admin processing, benefits admin)
- Leveraging the data (quality reporting, P4P data, feeding PHRs)
- Leveraging technology (standardized interfaces)
- Branding opportunities for providers, plans, purchasers

Stage 3: Value/fee-based services (sustainability)

- Core driver: Improve clinical care services
- Expansion of efficiency-based services & data leveraging
- Applications based on clinical data

Community Savings and Benefits
The Mobilization Planning effort has not estimated the specific additional benefits and saving that would be associated with expanded service offerings. However, the fundamental concept of developing value-based services is that the users/purchasers will derive economic and programmatic benefits at least as great as the cost of the services to

users. The previous HIE Options planning did examine the benefits of a medication list compilation service and found significant benefits but not as great as the results and reports retrieval service when each were considered as stand alone applications. With the results and reports retrieval service in place, the net benefits (after costs) of a medication list project were significant.

Expected Costs

Similarly, the Mobilization Planning effort has not considered the costs associated with expanding the scope of service offerings. The technology planning has contemplated evolution of the technology services that would be required to provide additional services. The process used to collect information from vendors regarding costs included discussion of the impact an expanded scope of services. Once the core results and reports retrieval service is operational, the costs of expanding the scope of services and incremental impact on technology components, customer support services and staffing would be modest.

SUPPORTING INFORMATION

Appendix A: Benefits Analysis and Community Savings Methodology

The MPHIE results and reports retrieval functions are projected to result in significant community savings over time. Potential annual savings eventually achievable (ten years or more) are estimated to be in excess of $20 million with over $12 million per year achievable within five years.

The source of savings related to results and reports retrieval project include:

- Avoidable ambulatory visits, laboratory tests and imaging studies
- Avoidable emergency department laboratory tests, imaging studies and hospital admissions
- Processing savings – less paper-based processing and labor in distributing information
- Physician rework – multiple or repeated history taking
- Physician/staff productivity – unsuccessful looking for information
- Employer time-loss saving for avoided services

Benefit Estimation Methods

A number of models have been published for estimating the benefits of various health information technologies. For the most part, these studies have focused on estimating benefits and savings for the whole United States or specific provider settings. The key studies relevant to the MPHIE include:

- Schmitt KF et al, Financial analysis projects clear returns from electronic medical records. Healthcare Financial Management, January 2002.
- Wang SJ et al, A cost-benefit analysis of electronic medical records in primary care. Am J Med April 2003.
- Brailer DJ et al, Moving Toward Electronic Health Information Exchange, Interim Report on the Santa Barbara County Data Exchange (SBCDE), California Health Care Foundation, July 2003.
- Johnston D et al, The value of computerized provider order entry in ambulatory settings. Center for Information Technology Leadership (HIMSS) report, 2003.
- PSI/FCG, Value of community clinical information sharing network, 2004.
- Walker J et al, The value of health care information exchange and interoperability. Health Affairs, January 2005; and companion CITL report (HIMSS) report 2004.
- Smith PC et al, Missing clinical information during primary care visits, JAMA February 2, 2005.
- Hilstead R et al, Can electronic medical record systems transform health care? Potential health benefits, savings and costs. Health Affairs, September/October 2005; and supporting RAND reports MG272, MG408, MG409, MG410.
- Miller RH et al, The Value of Electronic Health Records in Solo or Small Group Practices, Health Affairs, September/October 2005.

These studies use a variety of techniques to estimate various categories of benefit opportunities. Selected savings opportunities, methods and parameters were drawn from these studies to develop MPHIE benefit estimates.

POTENTIAL Benefit Calculations: For any given savings opportunity category, benefits are calculated with the following sequential process:

1. Determine the Gross Potential Benefit at 100% adoption assuming zero current adoption.
2. Subtract the maximum possible benefit that is achievable when fully deployed and adopted (typical range of 85 to 95%).
3. Subtract the existing level of adoption and benefits already achieved.
4. The result represents the Net Potential Benefit.
5. Allocate net potential benefit among HIT functions (EHR, HIE, CPOE, eScribing, etc.) that affect the achievement of the benefits.
6. Determine the portion of net potential HIE benefits that can be addressed with the scope of the results and reports retrieval project (typically 65%)
7. The result represents the POTENTIAL project benefits ultimately achievable.

For the results and reports retrieval project the POTENTIAL project savings are >$20 million per year.

POTENTIAL Savings: Total POTENTIAL Savings (eventually achievable) are currently estimated at over $20 million per year, as follows:

Avoided services	$8.8 million
Routine paper processing	0.2 million
Non-routine paper processing	5.4 million
Physician productivity	4.1 million
Practice office productivity	1.7 million
Avoided time-loss	1.2 million
Total Savings	**$21.4 million**

Avoided visits, laboratory and imaging test savings of $8.8 million results in savings to the various payers which include primary health plan coverage, secondary coverage and patients. A distribution of the avoidable services savings by the primary payer category is shown in the following table.

Avoided Services Savings by Primary Payer Type	Estimated Expense Exposure	Avoided Services Savings
Uninsured (mostly providers, some patient pay)	8.2%	$ 722
Medicare	17.2%	1,514
OHP, Medicaid, CHIP, etc via FCHP	7.1%	625

OHP, Medicaid, CHIP, etc via FFS, other	1.2%	106
Oregon Domestic Insurers (13 plans)	45.6%	4,013
Largest Reportable Foreign Insurers (10 plans)	7.0%	616
Other Reportable Foreign Insurers (92 plans)	0.5%	44
Self-insured plans	13.2%	1,162
Oregon Veterans Population (data not available)	NA	NA
Total Avoided Service Savings	100.0%	$ 8,800

Table notes:

- Medicare Advantage patients are included with insurance plans since the risk is borne by plans not Medicare.
- Fully Capitated Health Plans (FCHP) bear the risk for most of the Oregon Health Plan/Medicaid patients.

Reduced inefficiencies result in savings to the various organization or practices that are able to benefit easier access to information with fewer manual and/or paper processes. The distribution of reduced inefficiency savings among the affected organization categories is shown in the following table.

Reduced Inefficiencies	Savings
Processing Savings - Health Systems	$532
Processing Savings - Free Standing Entities	102
Processing Savings - Physician Practices #	4,737
Processing Savings - Payers	140
Physician/staff Productivity Loss Seeking Info #	1,741
Physician Productivity - Repeated Histories #	4,112
Time-loss & Staffing Savings to Employers on Avoided Services	1,249
Total Reduced Inefficiencies	$12,613

Includes hospital/health system practice/clinics & EDs

Community Savings Realization Projections

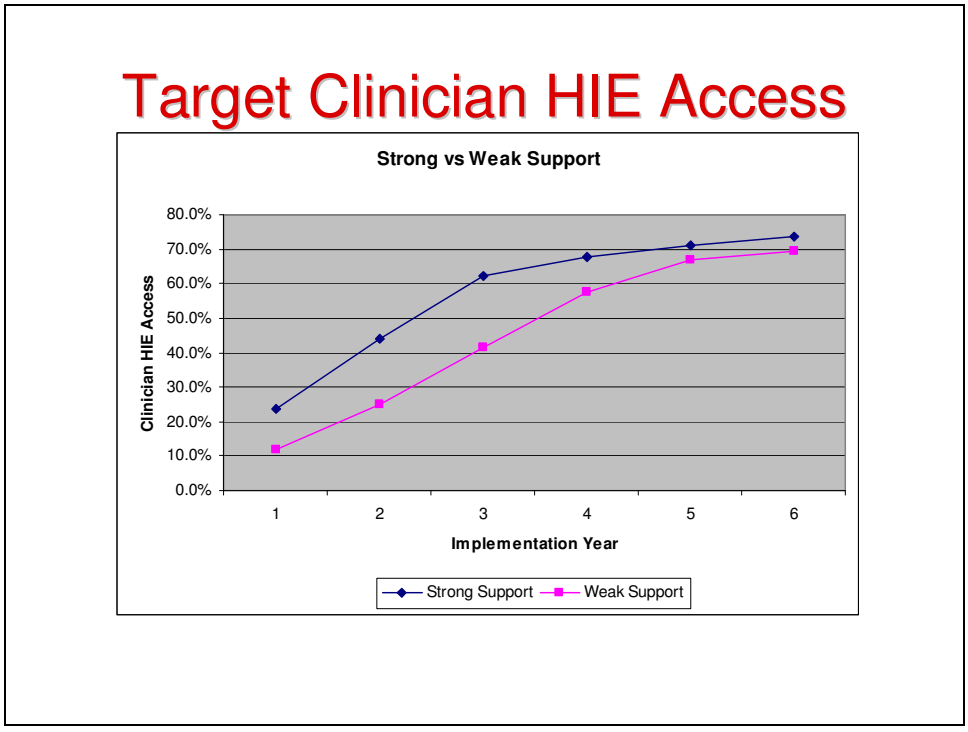
Benefit Realization Methods: The realization of benefits will be distributed over time as the project is implemented, end-users begin taking advantage of the MPHIE, and savings begin occurring. The estimation process for benefit realization includes the following steps:

1. Determine the organizations, clinical practices and specialties that are the primary drivers for achievement of projected benefits and savings. (Target specialties for the MPHIE are primary care, medical specialties, pediatrics and specialties, obstetrics/gynecology, emergency medicine and hospitalists. The Tri-County area includes 2,687 clinicians in the target specialties including physicians (MDs and Dos) as well as nurse practitioners and physician assistant clinicians (NPs, PAs, CNMs). Ninety percent of projected savings from avoided services are expected to be related to these targeted specialties and clinicians).
2. Estimate the implementation phasing by which various hospitals and clinical practices will begin accessing the MPHIE up to the expected ceiling of adoption (usually 90%).
3. Estimate the lag between MPHIE access by clinicians to their actual utilization and change in ordering practices that result in the projected savings. For the results and reports retrieval, realization of benefits is assumed at 25% in year 1 of access, 50% in year 2, 75% in year 3 and 100% thereafter.
4. Estimate the impact on the access and/or adoption/benefit realization schedules from aggressive adoption support efforts such as training, incentives, etc.

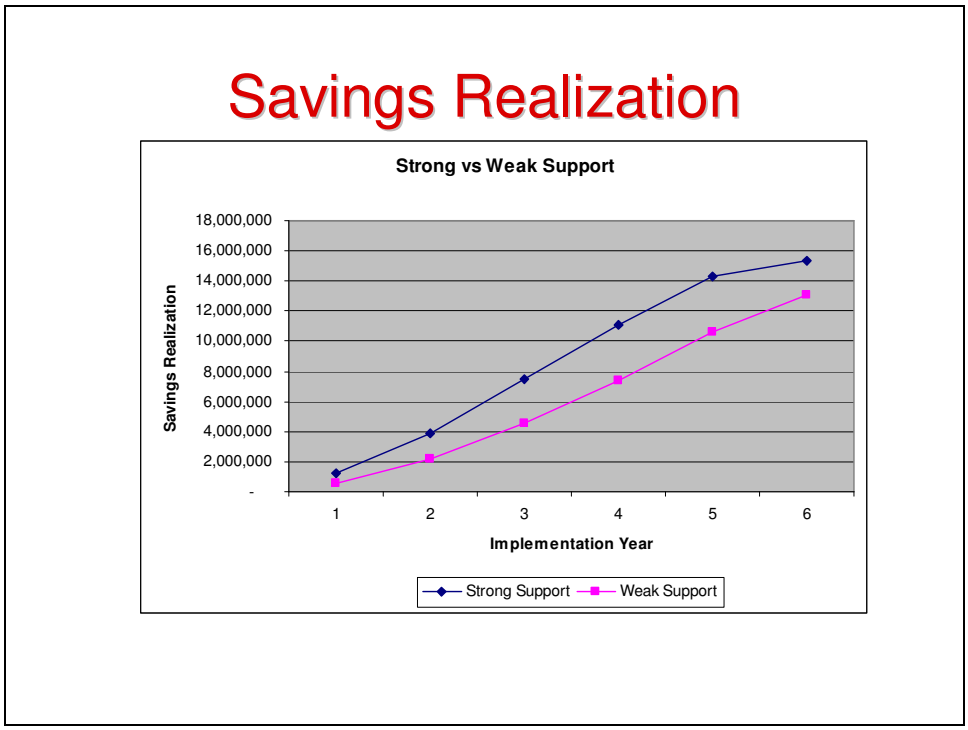
Expected Participation: The operating plan for the MPHIE assumes that Kaiser, Legacy, OHSU and Providence health systems would all become active participant in the MPHIE during the first operational year, including their health systems clinician practices, laboratories, imaging centers and hospitals. Actual participation during the first year may be phased for the convenience of the MPHIE and the health systems. OCHIN (serving the safety-net clinics) and four large clinician practices with electronic medical records systems are projected to start participation in year 1. Other hospitals, laboratories, imaging centers and clinician practices are expected to begin their MPHIE on a phased basis over the first several years of operation of the MPHIE.

Community savings are estimated under two scenarios. First, adoption and the consequent savings realizations are estimated assuming minimal encouragement and support for adoption by clinicians – the Without Adoption Support scenario. Second, adoption and consequent savings are estimated assuming an active adoption support program as reflected in the cost estimates for the MPHIE and health systems – the With Adoption Support scenario.

Total clinician participation from the targeted specialties is reflected in the following graph under the With and Without Adoption Support scenarios.



Total community saving realized under the with and without adoption support scenarios is shown in the following graph.



With Adoption Support: Under the With Adoption Support scenario the net realized savings for the community are reflected in the following table. In the With Adoption Support scenario $200,000 is budgeted for adoption support in each year.

Annual Net Realized Savings – With Adoption Support (in $ millions)

REALIZED SAVINGS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Avoidable Services	0.4	1.3	2.6	3.8	5.0	5.4
Reduced Inefficiencies	0.7	2.2	4.2	6.1	7.8	8.3
Total	1.1	3.5	6.8	9.9	12.8	13.7
OPERATING COSTS	3.4	3.4	3.4	3.4	3.4	3.4
NET REALIZED SAVINGS	-2.3	0.1	3.4	6.5	9.4	10.3

Cumulative Net Realized Savings – With Adoption Support (in $ millions)

REALIZED SAVINGS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Avoidable Services	0.4	1.7	4.3	8.1	13.1	18.5
Reduced Inefficiencies	0.7	2.9	7.1	13.2	21.0	29.3
Total	1.1	4.6	11.4	21.3	34.1	47.8
OPERATING COSTS	3.4	6.8	10.2	13.6	17.0	20.4
NET REALIZED SAVINGS	-2.3	-2.2	1.2	7.7	17.1	27.4

Under the With Adoption Support scenario, realized savings cover operating costs in year 2, with a cumulative net savings breakeven achieved in year 3. Total annual realized savings in excess of $12 million are achieved in year 5 with an adoption support program.

Without Adoption Support: Under the Without Adoption Support scenario the net realized savings for the community are reflected in the following table. In the Without Adoption Support scenario nothing is budgeted for adoption support in each year.

Annual Net Realized Savings – Without Adoption Support (in $ millions)

REALIZED SAVINGS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Avoidable Services	0.2	0.6	1.4	2.3	3.5	4.5
Reduced Inefficiencies	0.4	1.4	2.7	4.3	6.0	7.2
Total	0.6	2	4.1	6.6	9.5	11.7
OPERATING COSTS	3.2	3.2	3.2	3.2	3.2	3.2
NET REALIZED SAVINGS	-2.6	-1.2	0.9	3.4	6.3	8.5

Cumulative Net Realized Savings – Without Adoption Support (in $ millions)

REALIZED SAVINGS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Avoidable Services	0.2	0.8	2.2	4.5	8.0	12.5
Reduced Inefficiencies	0.4	1.8	4.5	8.8	14.8	22.0
Total	0.6	2.6	6.7	13.3	22.8	34.5
OPERATING COSTS	3.2	6.4	9.6	12.8	16.0	19.2
NET REALIZED SAVINGS	-2.6	-3.8	-2.9	0.5	6.8	15.3

Under the Without Adoption Support scenario, realized savings cover operating costs in year 3, with a cumulative net savings breakeven achieved in year 4. Total savings in excess of $9 million are achieved in year 5 with Without Adoption Support.

These net realized saving calculations do not include the in-kind and other costs that would be incurred by the health systems and other data providers. In aggregate costs of all the various organizations participating in the MPHIE are probably around $1 million per year.

Cumulative Community Savings: MPHIE operating costs are currently estimated at $3.4 million per year under the With Adoption Support scenario for a six year total cost of $20.4 million. Over the six year period the community would derive $47.8 million of savings or $27.4 million after MPHIE operating costs. Assuming $1 million per year in in-kind and other costs of the participating health systems, the net saving to the community over the six years would be $21.4 million.

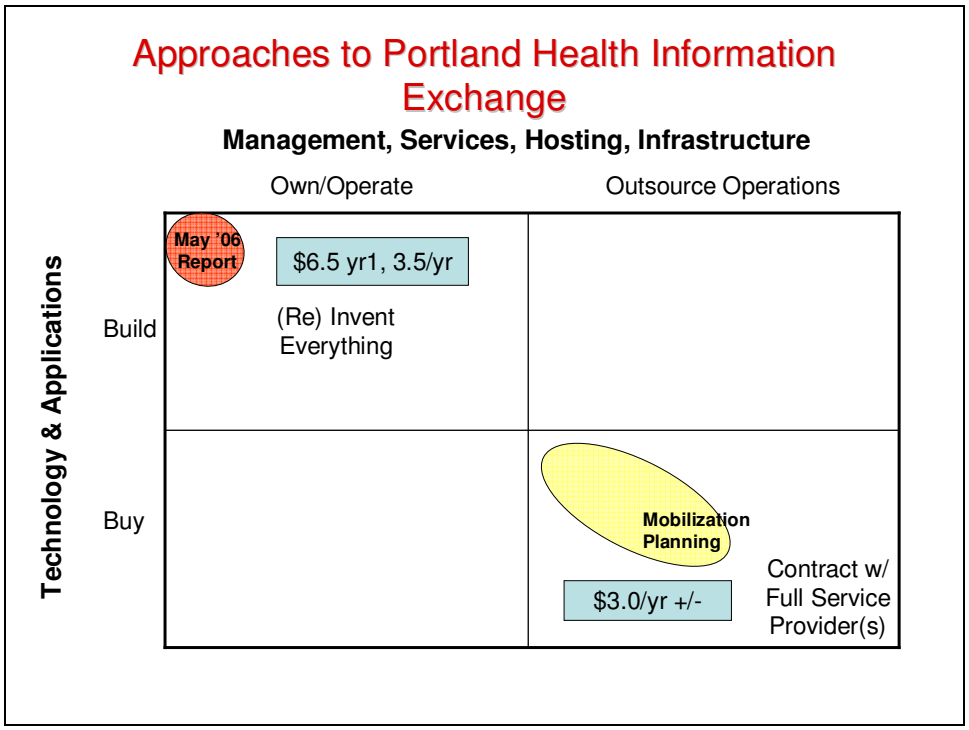
Caveats About Community Savings: The community savings identified are estimates of benefits that can be achieved by implementing the MPHIE to provide results and reports retrieval. The goal is to improve clinical care in the community, avoid the provision of unnecessary or duplicative services and reduce inefficiencies in providing clinical care. Avoidable service savings will be reflected in reduced service billings to health plans and patients. The productivity improvements from reduced inefficiencies are more difficult measure and indeed may be difficult to capture as reduced operating costs for some providers. Measuring savings could prove difficult given that other changes in the health care delivery system may obscure the results.

Appendix B: MPHIE Architecture and Operating Costs

The May 15, 2006 report on HIE Options utilized costs estimates based on a set of assumptions relevant for evaluating alternative project options, including: (a) a generic, common architecture that could support the various options under consideration, (b) a free-standing technology data center owned and operated by the Exchange, and (c) purchased software and hardware components that would be installed and integrated by the HIE with a staff of 23 FTE. The projected costs were $6.5 million in year 1 and about $3.5 million per year thereafter.

The Mobilization Planning is focused on (a) identifying an appropriate and cost effective technology architecture for the results and retrieval project and (b) exploring collaboration or contracted-out solutions to minimize the costs. The technology architecture planning not only considers the initial support of the results and retrieval project but also assures that further development of HIE function can occur in an orderly fashion with minimal incremental costs or other adverse financial or programmatic impacts.

The following graphic illustrates the contrast between the May 2006 HIE Options report assumptions and the Mobilization Planning assumptions.

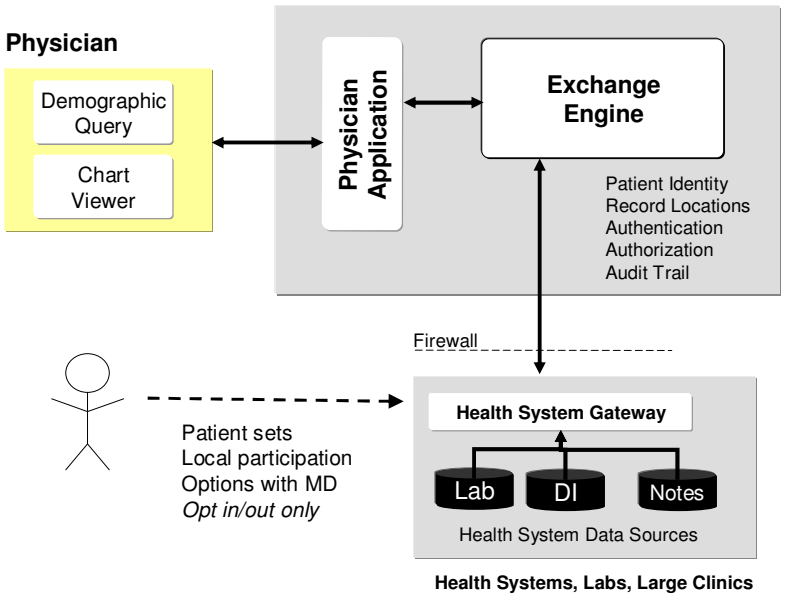


Key Mobilization Planning findings from the technology requirements and system architecture planning for the MPHIE determined that:

- Solutions are commercially available that match MPHIE needs.
- ASP (application services provider) model: thin central services, federated models exist that allow the leverage of existing systems.
- Several vendors are operating HIEs in multiple places.
- Interoperability standards development and adoption is accelerated to support standardized solutions.
- EHR vendors are adapting quickly for integrating data accessed through an HIE.
- Consumer-oriented privacy and access control solutions are closer to reality.

Federated Model of Infrastructure and Operations

Health systems, physician groups, laboratories, and imaging centers would participate in the HIE by creating a "federation" which implies a shared governance, operating and policy framework, and technology strategy. In the federated model, there is no requirement for a large central database to aggregate patient information; rather, **participants maintain data stores inside their own organizations, which are queried via the exchange by authorized providers**. A lightweight appliance or "gateway" served as the connection point between the participating systems and the exchange. The gateway is easy to install, uses existing interface standards, and creates minimal impact on the operations of the source systems used for clinical care by the providers.



HIE Infrastructure. Central services consist of patient identity management, record location services/document registry, security services to include authentication, authorization, and audit trail, and the ability for patients to control their participation options in the exchange. The exchange should also provide patients with the capability to view their own data (red box, upper left). Physicians would query data from the exchange with a standalone web portal. There is no central storage of clinical data. Lightweight edge servers or "Gateways" would reside at the health systems, receive and convert data from source systems/interfaces, and register patients and records with the HIE. Note that the first level of patient control over participation is at the health system, where the patient decides whether to participate in the exchange.

Operating Costs

Based on this federated system architecture, cost estimates were solicited from four vendors for operation of the MPHIE as an ASP model. Key findings from the process are that the HIE exchange: operations and the ASP vendor contract would represent:

- +/- $3 million/year based on information from 4 vendors based on retail pricing
- Small central MPHIE staff of 3-4 positions to support leadership, participant coordination, contract management functions.

The Mobilization Planning identified two additional financing requirements to maximize the success of the MPHIE that would not be covered by the ASP vendor contract and small central MPHIE staff. First, consumer trust and confidence regarding the privacy of their information is a sensitive issue that will require some dedicated resources for brochure development and technical assistance to participating organization. Consumer engagement

support is budgeted at $200,000 per year. Second, achieving the expected savings will be affected by the level of effort committed to supporting clinicians and participating organizations in the training of personnel to take advantage of the MPHIE resources. Adoption support including education and training program development and technical assistance is budgeted at $200,000 per year.

Total MPHIE costs for the results and reports retrieval services are projected at about $3.4 million per year.

Impact on Participating Organizations: The Mobilization Planning also considered the impact that the results and reports viewing project would have on the participating organization. The major participating organizations are likely to would participation-related costs as follows:

- Data Suppliers: hospitals, labs, imaging
    - Edge server, staff time to interface, monitor
- Clinical Users: hospitals, practices
    - Need champion clinician support
    - Inclusion of MPHIE access into training/orientation efforts
    - Workflow redesign to leverage HIE access and benefits
    - Eventual integration into local EHR systems

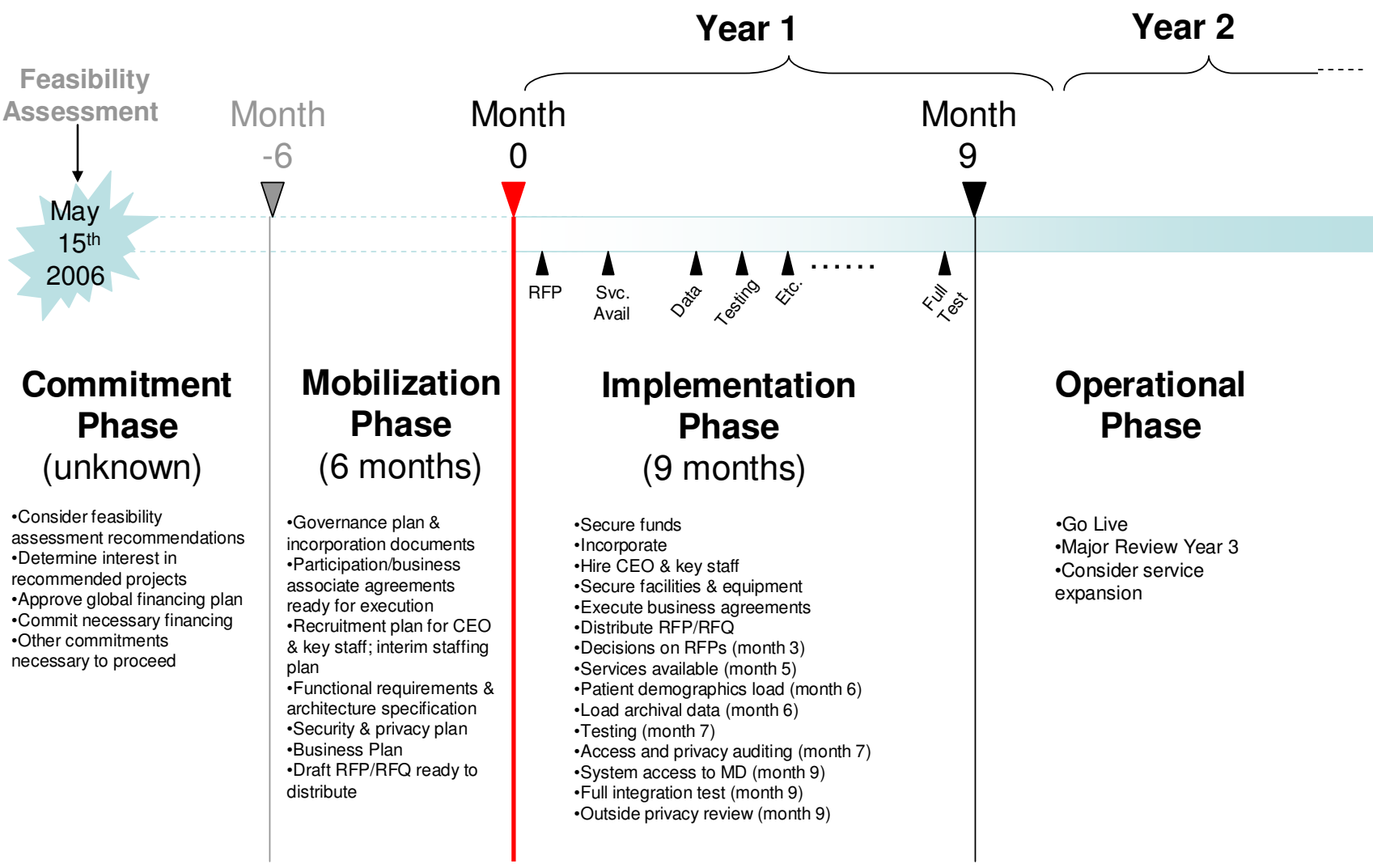
It is estimated that each of the major health systems will incur internal costs of about $100-150,000 per health system during the first several years of MPHIE operations. Other hospitals, commercial laboratories, imaging centers, and physician practices will incur some lower level of internal costs to support their MPHIE participation.

For planning purposes the operating budget of $3.4 million per year is shown below. The expenditure plan assumes that contractors will initially fulfill the roles of key staff positions while the recruitment process is underway. Additional information on the staff roles and other costs are shown in the MPHIE Operations Plan. Cost estimate for the ASP vendor contract represent the largest component of the budget. The ASP vendor estimate is based on cost estimate discussions with four vendors. The vendor supplied information was based on costs they were willing to discuss on a preliminary basis and no doubt will be different when vendor proposals are submitted in a competitive situation. The project timeline is also shown below.

MPHIE COST ESTIMATE		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
MPHIE Staffing	Salary Rate	FTE	FTE	FTE	FTE	FTE	FTE	Salary	Salary	Salary	Salary	Salary	Salary
Executive Director (CEO)	120,000	0.50	1.00	1.00	1.00	1.00	1.00	60,000	120,000	120,000	120,000	120,000	120,000
Product/Program Manager (CTO/COO)	100,000	0.50	1.00	1.00	1.00	1.00	1.00	50,000	100,000	100,000	100,000	100,000	100,000
Office admin support	30,000	0.60	0.60	1.00	1.00	1.00	1.00	18,000	18,000	30,000	30,000	30,000	30,000
Implementation coordinator	80,000	0.50	1.00	1.00	1.00	1.00	1.00	40,000	80,000	80,000	80,000	80,000	80,000
Subtotal Salaries		2.10	3.60	4.00	4.00	4.00	4.00	168,000	318,000	330,000	330,000	330,000	330,000
Fringe Benefits		28%	28%	28%	28%	28%	28%	47,040	89,040	92,400	92,400	92,400	92,400
Subtotal Personnel Cost								215,040	407,040	422,400	422,400	422,400	422,400
Contracted Services													
Interim Executive Director	153,600	0.50						76,800	-	-	-	-	-
Interim Technology Officer	128,000	0.50						64,000	-	-	-	-	-
Physician Liaison (CMO)	160,000	0.40	0.40	0.25	0.25	0.25	0.25	64,000	64,000	40,000	40,000	40,000	40,000
Subtotal Contracted Services		1.40	0.40	0.25	0.25	0.25	0.25	204,800	64,000	40,000	40,000	40,000	40,000
Other Operating Expense	Cost Factor												
Space rental	1000 square feet @ $20 per square foot per year							20,000	20,000	20,000	20,000	20,000	20,000
PC, printer, desk, chair, files, etc	$4,000	per employee for year 1, 20% thereafter						16,000	3,200	3,200	3,200	3,200	3,200
Office/desktop software	$1,000	per FTE per year						2,100	3,600	4,000	4,000	4,000	4,000
Telephone-cell phone	$100	per FTE per month						2,520	4,320	4,800	4,800	4,800	4,800
Internet access/connectivity	$100	per FTE per month						2,520	4,320	4,800	4,800	4,800	4,800
Website support & storage	$200	per month						2,400	2,400	2,400	2,400	2,400	2,400
Supplies and services	$100	per FTE per month						2,520	4,320	4,800	4,800	4,800	4,800
Copying and printing	$100	per FTE per month						2,520	4,320	4,800	4,800	4,800	4,800
Subscription and memberships	$2,000	per year						2,000	2,000	2,000	2,000	2,000	2,000
Meeting expenses – board/committees	$2,000	per year						2,000	2,000	2,000	2,000	2,000	2,000
Travel & professional meetings	$2,000	per trip, 10 trips per year						20,000	20,000	20,000	20,000	20,000	20,000
Payroll and accounting services	$300	per month						3,600	3,600	3,600	3,600	3,600	3,600
Audit, legal, professional services								25,000	25,000	25,000	25,000	25,000	25,000
Insurance - general liability/E&O								12,000	20,000	24,000	24,000	24,000	24,000
Insurance - product liability								12,000	20,000	24,000	24,000	24,000	24,000
Other Expenses								2,980	9,880	8,200	8,200	8,200	8,200
Subtotal Other Operating Costs								130,160	148,960	157,600	157,600	157,600	157,600
Total MPHIE Operations Costs								**550,000**	**620,000**	**620,000**	**620,000**	**620,000**	**620,000**
Special Program Support													
Consumer Engagement								200,000	200,000	200,000	200,000	200,000	200,000
Adoption Support								200,000	200,000	200,000	200,000	200,000	200,000
Total Special Programs								400,000	400,000	400,000	400,000	400,000	400,000

ASP Services Contract								2,450,000	2,380,000	2,380,000	2,380,000	2,380,000	2,380,000
TOTAL COST ESTIMATE								**3,400,000**	**3,400,000**	**3,400,000**	**3,400,000**	**3,400,000**	**3,400,000**

MPHIE Project Phases



Commitment Phase (unknown)

- Consider feasibility assessment recommendations
- Determine interest in recommended projects
- Approve global financing plan
- Commit necessary financing
- Other commitments necessary to proceed

Mobilization Phase (6 months)

- Governance plan & incorporation documents
- Participation/business associate agreements ready for execution
- Recruitment plan for CEO & key staff; interim staffing plan
- Functional requirements & architecture specification
- Security & privacy plan
- Business Plan
- Draft RFP/RFQ ready to distribute

Implementation Phase (9 months)

- Secure funds
- Incorporate
- Hire CEO & key staff
- Secure facilities & equipment
- Execute business agreements
- Distribute RFP/RFQ
- Decisions on RFPs (month 3)
- Services available (month 5)
- Patient demographics load (month 6)
- Load archival data (month 6)
- Testing (month 7)
- Access and privacy auditing (month 7)
- System access to MD (month 9)
- Full integration test (month 9)
- Outside privacy review (month 9)

Operational Phase

- Go Live
- Major Review Year 3
- Consider service expansion

Appendix C: Financing Issues

The major financing challenges for newly forming RHIOs and HIEs across the United States and for the MPHIE include:

- Nobody wants to pay for infrastructure, lots of HIE services are infrastructure.
- Misalignment of savings and costs, savings do not translate to HIE revenues.
- Cost vs. beneficiary misalignment
- Deep pockets of potential supporters vs. no pockets
- Not all pockets accessible
- How to finance start-up and transition to a self sustaining venture?

Unfortunately the savings and benefits from the results and reports retrieval service cannot be translated into revenue sources to finance the development and operations of the MPHIE. The improvements in the delivery of care and the resulting savings represent community-wide benefits. The most practical approach to financing the results and reports retrieval service is also on a community-wide basis.

This plan proposes that the health plans and health systems that have supported the Mobilization Planning provide the support to cover the MPHIE operating costs for the results and reports retrieval service of $3.4 million per year for at least the first five years.

Until the MPHIE organization is formally established with committed financing for a core service, it is not feasible to seriously pursue government grants, foundation or other support, or major collaborations such as the Medicaid Transformation initiative or the Oregon Public Reporting of Quality Measures (in connection with the Robert Wood Johnson Foundation's Aligning Forces for Quality initiative).

Long Term Financing

Based on experiences at other health information exchanges, the MPHIE should be capable of becoming a financially self-supporting enterprise based on service. Other health information exchanges are providing a broader array of services and revenue streams to support their operations. Developing value-based services with associated revenue streams requires an expansion of services beyond the results and reports retrieval functions.

Achieving self-sufficiency without broad-based community financing will depend on how quickly an expanded scope of services could be pursued. Even so, the initial four to six years of MPHIE operations will likely require some level of broad-based community-wide support before it can become fully self-sustaining. With a commitment to a broader range of services, the total community-wide support required for the MPHIE over the four to six years could be of $12 to 15 million.

Start-Up Financing

Possible source of start up financing include the participating stakeholders and other sources. It will be critical to secure programmatic and financial commitments from both health plans (insurers, FCHPs, self-insurers) and health systems. It is unclear, but seems unlikely that financial commitments could be obtained from participating physicians in the early stage of MPHIE development.

The MPHIE could also seek to maximize other financing form other sources including Federal health information technology grants and contracts, any other possible Federal sources or appropriations, Medicaid: transformation grants, other Medicaid sources including any possible pass-through options to FCHPs, State appropriations and foundations. However, pursuit of these other sources is not feasible in the absence of an already financed core operation. Once the MPHIE is organized and committed to become operational, these other sources could be tapped to accelerate further development.

Once the MPHIE is operational it should seek to develop additional revenue sources and leverage is core services by considering expanding the geographic scope as well as expanding the programmatic scope with such options as medications list and medication-reconciliation support, ePrescribing, eligibility validation, claims processing and others.

THE BIG QUESTION ?: The big question facing MPHIE development is - **What is a fair and realistic way for the community to finance 3-5 years of start-up costs until we get to self-sufficient operational financing?**

In addressing THE BIG QUESTION it is useful to summarize the flow of potential savings among the various stakeholders and beneficiaries. The following table shows the distribution of avoided services saving and reduced inefficiency savings divided between health care providers (hospitals and physicians) and payers/purchasers (health plans and employers). The table also shows the impact of lost revenue related to avoided services.

Savings Recap: Providers & Plans

	Potential Savings	Savings to **Providers**: Hosp/Phys	Savings to **Payers**/ Purchasers
Avoided Services	$8.8 M	8%*	92%
Reduced Inefficncs	12.5 M	90%	10%
Combined Savings	$21.3 M	53%	47%
Revenue Losses	<$8.1 M>	<100%>	
Net Savings	$13.2 M	29%	71%

***Avoided services saved on uninsured patients**

Ninety-two percent of the avoided services savings accrues to payers. The 8% of avoided services savings to providers represents services that would have been provided to uninsured patients. Ninety percent of the reduced inefficiency savings accrues to providers. Overall the savings are distributed 53% to providers and 47% to payers. However, after the offset of the revenue losses that only impact providers, savings are 29% to providers and 71% to payers.

The beneficiary distribution among providers is messy. The following table shows the distribution of the provider savings between hospitals/health systems and physician practices. This distribution is messy because some physician practices are part of the health systems and that is not reflected in the table.

Savings Recap: Among Providers

messy split, some practices at health systems

	Potential Savings	Savings to Hospitals	Savings to Practices
Avoided Services	$0.7 M*	71%	29%
Reduced Inefficncs	11.2 M	5%	95%
Combined Savings	$11.9 M	9%	91%
Revenue Losses	<$8.1 M>	<49%>	<51%>
Net Savings	$3.8 M	<$2.7 M>	$6.5 M

*Avoided services saved on uninsured patients

Among providers, 71% of the avoided services savings are related to the hospitals due to care they provide to uninsured patients. Ninety-five percent of the reduced inefficiency savings accrue to physician practices (including those within health systems) since the bulk of the reduced processing costs and productivity savings are in clinician practices. The combined saving accrue 9% to hospitals/health systems and 95% to practices. After offsetting revenue losses, hospitals have $2.7 million loss and practices have a $6.5 million favorable savings.

Start-up Financing Allocation Options: Some options for allocating shares of the start-up financing among stakeholder sectors include at least the following:

- Equal shares among large organizations similar to the funding mechanism used by the OBC Data Exchange Group in funding the Options Planning and this Mobilization Plan.
- Sector parity: 50% plans and purchasers, 50% providers (hospitals and physicians).
- Net savings distribution: 70% plans / purchasers, 30% providers (hospitals /physicians).
- Net savings distribution after consideration of the internal health systems implementation costs.

For the last three options, there would need to be some mechanism to determine how various organizations within each group should participate in the start-up financing.

Other Considerations Affecting Start-up Financing Approaches

- How should smaller organizations participate in the financing?

- How to deal with mix of organization types, i.e., health plans, health systems/hospitals, and hybrid organizations that operate both health plans and health systems?
- Should organizations with deep pockets cover the share of organizations or sectors with shallow or inaccessible pockets?
- Should each sector figure out its financing allocations?
- How should public sector payers (Medicare and OHP/Medicaid) participate?
- Can employer self-insured plans participate through their third-party administrators?
- Since the realization of significant portions of the community savings are dependent on clinician adoption, should incentives be provided to encourage rapid adoption and use of the MPHIE?

Appendix D: Financing at Other RHIOs/HIEs

There are a number of health information exchanges (HIEs) and regional health information organizations (RHIOs) that are financially self-sustaining based on the scope of services and revenue generation mechanism unique to each local environment.

The initial project for the MPHIE results and reports retrieval project is quite narrow compared to services at self-sustaining HIEs, especially since results retrieval is a different service and functionality than results distribution. Services offered at other HIEs include:

- Claims/payment transactions, related services
- Coverage & eligibility verification
- Lab results distribution
- Clinical data access & retrieval
- Common interfaces to physician EHRs
- Messaging & referral between physicians
- Quality reports to plans & purchasers
- Physician practice quality reporting & data

Long-term revenues sources at other self-sustaining HIEs include:

- Result/report distribution fees
- Subscription fees to access services
- Claims & related transaction fees
- A la carte fees for data or reports
- Member participation fees

The options for developing MPHIE ongoing financing revenues include:

- Membership fees - participation subscriptions: purchasers, health plans, health systems, IPAs, (physicians, patients)
- Service subscriptions: service bundles(s)
- Transaction processing fees: distribute results, eligibility/claims info, feed PHRs

The origins and sources of core financing for other HIEs include such examples as the Utah Health Information Network (claims processing), HealthBridge in Cincinnati (results distribution), Indiana Health Information Exchange (research network pooling clinical data involving into results distribution), Taconic RHIO, NY (physician EHRs and feeding data to EHRs). The following information was collected from the organization websites and summaries contained in documents by other projects.

Examples of start-up and ongoing financing mechanisms at other HIEs are:

Utah Health Info Network

- Start up financing (1993)
  - $350K (14 orgs @ $25K), voting directors
- Core Claims Exchange Service
  - 70% payers, 30% providers financing
  - Payers: 17¢/claim, .025¢/remit, $450K cap
  - Physicians: scaled by practice size $60-120/yr per physician
  - Hospitals: $540/yr small to $6K/yr large
- Other services & fees for credentialing, account reconciliation, claim attachments
- Adding clinical info distribution

Indiana Health Info Exchange

- Grew out of Regenstrief's research funded Indiana Network for Primary Care (INPC)
- Basic services financing:
  - $0.17-0.37 per transaction fee for distribution of results by labs (clinical messaging, volume-based sliding scale)
  - $0.30 PMPM by insurance companies to provide quality reports
- No fees for clinician access to data

Taconic RHIO

- Start-up financing:
  - IPA investment: $2 million
  - Grants & contracts: $1.8 million
- Basic services financing (per year)
  - $72K per hospital (29)
  - $7.2K per MD for EHR/eRX/HIE services (half offset by grants until P4P incentives start)
  - Total > $15 million/year

HealthBridge –Cincinnati

- Start up financing: (1997)
  - $250K loans from 5 health systems & 2 payers (later withdrawn)
- Basic Services: $2.6 million per year
  - 7 Hospitals/health systems monthly dues (80%)

- Access fees by transcription & billing companies (20%)

CareSpark (NE-TN/SW-VA)

- Start-up financing (over 3 years)
  - In kind donations (corporations) $4.2 million
  - Grants/contracts $4.6 million
  - Contributions: foundations $1.3 million, 250K other
- Basic services
  - $0.?? per transaction fee for distribution of results by labs, hospitals, clinics, etc
  - $1.40 – 2.00 PMPM by insurance companies guidelines, member messaging, performance measures, care coordination
- Optional services
  - PHRs, UR & case management, evidence-based formulary
  - a la carte PMPM pricing to employers or plans

Vendor Suggested Model: In the process of collecting cost information from various ASP vendors, several vendors suggested revenue models for HIE services. A synthesis of those suggestions includes:

- Start-up financing: provider organizations
  - Finance organizing plus their own server/gateway machines
- Base Services financing: (per year)
  - HIE access, data distribution
  - $500 per MD
  - $75K to $250K per hospital/health system
  - $1 per enrollee from employers
  - Premium Services: additional charges

AHIC Report on Health Information Exchange Business Models

The American Health Information Community (AHIC) meeting of January 23, 2007 included presentation of the results from "Task #2: Report and Recommendations on the Health Information Exchange Services That Are Financially Sustainable." The report can be found at http://www.hhs.gov/healthit/documents/AHICBinder20071023.pdf, pages 65-95. The purpose of Task #2 was to "Identify, examine and analyze health information exchange (HIE) services that have achieved financial sustainability." Section 2.1 of the report identifies several different types of specific exchange services of clinical data the following HIE services, including:

- Patient summary—the ability to retrieve a comprehensive set of clinical data from regional providers (and payers) for a specific patient. For example, this retrieval might involve a request by a physician to pull data for a patient who was just admitted to the emergency room. The information included in the resulting patient summary would depend on the type of data available. For example, it could be simply a medication history for the patient, or it could be a more comprehensive set

of data, including laboratory results, transcribed notes, radiology images, and EKG results.

- Clinical messaging—the delivery of clinical results (e.g., discharge summaries, laboratory test results, consult notes) from the organization that generates the data (e.g., laboratory, radiology center) on a push basis to a targeted set of recipients (e.g., the referring physician).
- ePrescribing—involving the movement of prescription-related transactions among providers, pharmacy benefit managers (PBMs), and pharmacies.
- Quality measurement—clinical data can be aggregated and used for reporting on the achievement of quality measures and for decision support (e.g., reminders) to improve clinical care.
- Biosurveillance or syndromic surveillance—involving monitoring of clinical data (e.g., emergency department chief complaint, positive lab results) for disease outbreak or bioterrorism event.
- Chronic disease management or other population-based services—clinical data can be used to aid in the management of chronic or other diseases that impact populations.

The report also notes that "In addition, the exchange of administrative data (data used for processing payment for healthcare services) can also be included under the broader HIE umbrella."

The MPHIE results and reports retrieval services provides the "patient summary" functionality described in the AHIC Task#2 report.

Appendix C – Description of Findings from Interviews provides detailed information on each of the types of functionality at several financial sustainable HIEs.

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

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

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

Regenstrief Institute, Inc. (RI)
URL: www.regenstrief.org
1050 Wishard Blvd., RG6, Indianapolis, IN 46202
Contact: Marc Overhage

Indiana Health Information Exchange, Inc. (IHIE)

URL: www.ihie.com
351 West 10th St., Suite 252, Indianapolis, IN 46202
Contact: Marc Overhage, (317) 630-8586, moverhage@regenstrief.org

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

The following table shows the mix of services described in detail from various HIEs.

	Health Bridge	Regenstrief –Indiana HIE	Inland NW Hlth Srvcs	UHIN	NEHEN
Clinical Messaging	X	X	X		
Sharing Clinical Data at Time & Point of Care		X			
Medication History		X			
ePrescribing		X			
Quality Metrics		X			
Administrative Data Sharing				X	X
Credentially				X	

The summary of information on the sharing clinical data on a patient at the time and point of care at Regenstrief Institute contained in the report (pp. 22-23 in the report, pp. in the pdf file) is repeated verbatim as follows:

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

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

REGENSTRIEF INSTITUTE:

Service Provided:

Data Sources: The Indiana Network for Patient Care (INPC), Regenstrief's clinical data repository, receives more than 100 data feeds:

- More than 20 hospitals (includes hospital laboratories, pathology, radiology, EKG [text files], transcription, and registration)
- Indiana State Department of Health
- Marion County Health Department
- RxHub (PBM consortium)
- Regional reference laboratories
- Radiology centers
- Multiple physician practices
- Medicaid claims data (new and will go live with first data in about one month)

- Commercial payer claims data (several contracts have been signed and data has been received and is being evaluated for incorporation)
- Medicare (has committed to providing some data for limited purposes under a grant)

How Delivered: Two ways:

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

Number of Physicians Using It:

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

Architecture:

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

Standards Used:

- • HL7 formatted messages
- • All laboratory results are mapped to LOINC by Regenstrief.

Requirements:

Hospital or Other Data Source:

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

HIE Organization:

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

- Set up, monitor, and maintain network connections with all data recipients

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

Cost to Deliver the Service?: Undisclosed

Do Costs Exceed Revenue?: No

Market Characteristics That Make the Model Feasible:

- • History of collaboration among hospitals
- • Extremely valuable information in the clinical record provided to the clinician

Appendix E: Evaluation Metrics

Operational and Implementation Metrics (Years 1-2)

Key Performance Indicator	Measurement (To be Trended)	6 mth Expected Value
Funders Committed	funders committed / funders expected (6)	100%
Data Sharing Agmt Signed	Orgs signed / Orgs expected (10)	90%
Staff Hired	Staff hired / staff expected (4)	100%
Interfaces Built	Interfaces built / interfaces expected	
Patients in MPI	Patients / patients expected (1.6mil)	60%
Users Authorized	Users authorized / users expected (2500)	85%
Documents Listed in RLS	Docs listed / expected doc volume	

Workflow Metrics (Years 2-5)

Key Performance Indicator	Measurement (To be Trended)	Expected Value
HIE available to Physicians & staff	HIE portal on desktops / number of desktops	60% w/in 2 years
Physicians & staff trained	Attendees / expected attendees	75% w/in 1 year
Physician Overall Usage	Physician use once per week/Physicians registered	50% w/in 2 years
Demographic Usage	Physician retrieval of demographics / total visits	30% w/in 2 years
Faxing reduced	Faxes / baseline by organization	40% w/in 2 years
Phone calls for results reduced	Results calls / baseline	40% w/in 2 years
Reduction in lab tests	lab tests / baseline	

Clinical Usefulness Metrics (Years 2-5)

Key Performance Indicator	Measurement (To be Trended)	Expected Value
Physician Satisfaction	Survey	
Patient Satisfaction	Survey	

Overall Success Metrics (Years 5+)

Key Performance Indicator	Measurement (To be Trended)	Expected Value
Financially self sustaining	Revenue / expenditures for existing services	
Investment in new functionality	Additional Money invested	
Reduction in cost	Plan expenditure on labs / baseline	

Appendix F – Background, Sources, Related Documents

The MPHIE Mobilization Planning effort was commissioned and financed by the Oregon Business Council's Health Information Exchange Leadership Group. The project leadership team (Tiger Team) provided oversight and leadership in guiding the development of the planning included:

Andrew Davidson, Oregon Association of Hospital and Health Systems
Janice Forrester, PhD, The Regence Group
Dick Gibson, MD, PhD, MBA Providence Health Systems & Legacy Health Systems
Jody Pettit, MD, Oregon Health Care Quality Corporation & Office for Oregon Health Policy and Research

The Mobilization Planning effort was staffed by Oregon Health Care Quality Corporation. Staff and sub-contractors who contributed to various portions of this report include:

Nancy Clarke
Jody Pettit, MD
Tom Ricciardi, PhD
David Witter, Witter & Associates

For More Information please contact:

Oregon Business Council
1100 SW 6th Avenue, Suite 1508
Portland, OR 97204
Denise Honzel, honzelde@aol.com,
(503) 860-1278

Oregon Healthcare Quality Corporation
619 SW 11th Avenue, Suite 221
Portland, Oregon 97205
Nancy Clarke, nancy.clarke@q-corp.org
(503) 241-3571

The Mobilization Planning effort builds upon the report to the Oregon Business Council (OBC) Data Exchange Group titled "Oregon Health Information Exchange Options" dated May 15, 2006 available at http://www.q-corp.org/q-corp/images/public/pdfs/OR%20HIE%20Options.pdf.

The Mobilization Planning effort report relies on a number of sources of information including published studies, publications and reports of major organizations involved in health information exchange, and information collected from other regional health

information organizations (RHIOs) and health information exchanges (HIEs) and interviews and discussion with clinicians and other stakeholders in the community.

Key Mobilization Planning documents include

- MPHIE Final Report
- Metropolitan Portland Area Health Care Environment.
- MPHIE Technology Plan.
- MPHIE Privacy and Security Assessment.
- MPHIE Governance Plan.
- MPHIE Business Plan.
- MPHIE Operations Plan.