CHIDS Evaluation Framework for Sustainable Health Information Exchange

DC RHIO Current Progress and the Road Ahead

February 22, 2011

DISCLAIMER: The views and opinions expressed in this presentation are those of the author and do not necessarily represent official policy or position of HIMSS.
Conflict of Interest Disclosure

Kenyon Crowley, MBA, MS, CPHIMS
Donna Ramos-Johnson

Has no real or apparent conflicts of interest to report.
Learning Objectives

• List the key performance criteria for HIE sustainability
• Apply the Evaluation Framework to improve strategic planning for HIE initiatives
• Describe the ancillary activities that drive successful HIE operations
• Recognize how the DC RHIO is using the framework to support its HIE activities
Project Team

- Ritu Agarwal, PhD, Professor and Dean’s Chair of Information Systems, Director
- Kenyon Crowley, MBA, MS, CPHIMS, Associate Director
- Sunil Mithas, PhD, Associate Professor and Senior Research Fellow
- Jiban Khuntia, PhD Candidate, Graduate Research Fellow
- Melvin Lye, MBA, Graduate Research Fellow
- Edward Tao, BS, Research Fellow
Agenda
Research Objectives

1) Development of a multi-dimensional assessment model for HIE sustainability
2) Evaluation of DC RHIO’s performance
3) Set of recommendations to help guide DC RHIO’s evolution
DC RHIO Context

- In 2007, DC RHIO was launched to create a regional health information exchange (HIE) framework, infrastructure, and system
- DC RHIO was funded via a 3-year grant award from the District of Columbia (Tobacco Settlement funds) to be managed by the District of Columbia Primary Care Association (DCPCA)
- Initial focus on hospitals and safety net providers
- Objective to deliver tangible clinical and financial value for all RHIO stakeholders
- Triple Aim-based goals:
  - Health of the population
  - Enhance the patient experience of care (including quality, access, and reliability)
  - Reduce, or at least control, the per capita cost of care
DC RHIO Stage of Development

1. Amalga system is currently live in 2 hospitals and six clinics
2. Additional 2-3 hospitals and 2 clinics representing over two-dozen sites, respectively, are in the process of going live during 4th quarter 2010 – 1st quarter 2011.

<table>
<thead>
<tr>
<th>Stage 4</th>
<th>Well under way with implementation –technical, financial and legal. (Pilot project or implementation with multiyear budget identified and tagged for a specific need)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 5</td>
<td>Fully operational health information organization; transmitting data that is being used by healthcare stakeholders.</td>
</tr>
</tbody>
</table>

2/22/2011 ©2010 Healthcare Information and Management Systems Society
Research Activities

- Sustainability
- Business Models
- Governance
- Technology
- Stakeholders
- Policy
- Privacy and Security
- Case Studies

Environmental Scan

- Hospitals
- Clinics
- Public Health
- Benchmarks
- Payers
- DC RHIO
- Medicaid
- Technology Vendor

Semi-structured interviews

Benchmarking

- Health-Bridge
- MHIN
- DHIN

User Survey

- Hospitals
- Clinics

2/22/2011
Benchmarking

- All founded late 1990’s
- Business Model:
  - Tiered subscription - 100% commercially supported (HealthBridge & MHIN)
  - Legislated contribution - Federal (1/3), State (1/3), Customers (1/3) (DHIN)
- Core Services: Community data sourcing, print efficiency, results delivery, clinical messaging
Benchmark Insights

- Accelerating the pace of benefits
  - Quick wins are important – “easiest to implement with clear returns” is paper replacement or “print efficiency” such as a clinical messaging system to convert existing manual process to electronic system that is more efficient
- Avoiding competition -“The biggest hurdle that HIEs have to overcome is competition from the go-it-alone strategy” - not having aligned initiatives in a community
- Encourage usability and flexibility
  - Push system has clearer value proposition than a pull system
  - Keep adding data sources into the system – a strong network effect occurs
  - Flexibility for results delivery: EHR direct, clinical inbox, direct to fax
- Payers are not source of sustainable funds for HIE services, although assessments may provide funding and payers should be engaged
- Physicians only charged for services where there is clear and quantifiable value
- Support of broad dedicated coalition of stakeholders, public and private, strong leadership
Assessment Model

- Dimensions are inter-related and mutually reinforcing
- Adequate performance in each dimension is necessary for the overall success and continued viability of a RHIO
Value Creation and Sustainability

- The key to RHIO sustainability is to identify sources of value for each stakeholder group, create services to deliver the value, and monetize that value through appropriate pricing.

- A sustainable HIE reflects a situation where the costs and benefits of HIE are constructed so that ongoing HIE operations are funded based on the value generated from HIE.
Factors influencing sustainability

- Transaction efficiency
- Ability to quantify value
- Data availability
- Presence of competition (other HIEs or competing technologies)
- Scalable business model leveraging ASP or pay per use model of paying for services provided by vendors
- Avoiding fixed costs such as IT employees or investments in IT infrastructure without firm commitments from customers about usage, pricing and revenues
- Leverage cost by connecting to physician EMR
- Develop clinical drug trials and protocols directly with Pharma
- Develop quality and transparency pilots
- Develop pay-for-performance initiatives with payers
- Develop direct payer-coordinated claims processing efficiency pilot
HIE Value Areas

- **Physician Practices**: Quick wins include replacing those things that require the scanning and faxing, making a phone call.
- **Hospitals**: Reductions in clinician time spent searching for records, less time providing data to outside entities, reduced ER crowding, RN efficiency gains, enhanced ability to conduct clinical research, and higher reimbursements as a result of “meaningful use” compliance with electronic data sharing incentives.
- **Payers**: Healthier patients from better managed and coordinated care as well as decreased utilization of services.
  - While the logic of this is understandable, it is difficult to quantify the magnitude of this benefit and therefore to directly monetize the benefit for payers to fund HIE activity.
- **Labs**: Streamlining delivery of results, reducing administration costs.
- **Public Health**: Consistent with mission to promote and protect the health, safety and quality of life.
- **Other potential value recipients**:
  - Consumers
  - Clinical Research Organizations
Value Creation & Sustainability @ DC RHIO

“The ability to look at both the clinical data and the claims data is absolutely transformational.”

[Patients] “who have multiple chronic illnesses will definitely benefit from the RHIO.”

“...we can take care of our patients better because we have more information about what they are doing and how they are seeking care...”
Value Creation @ DC RHIO

DC RHIO Context
- Analysis reveals significant optimism among DC RHIO participants and stakeholders about its value creation potential
- While value creation is expected from most groups interviewed, interviewees indicated that the value was not yet being realized because of difficulties including but not limited to insufficient or missing patient data, and usability issues from non-integrated dual systems (i.e. separate EHR system and DC RHIO system)
- The sustainability of DC RHIO and its business model from this point forward are yet to be established

DC RHIO Needs
- Expand the potential pool of participants across the healthcare value chain and create willingness and commitment to pay
- Sustainability requires concerted broad public and private stakeholder support
- Interim funding will be required until sufficient operating revenues can be achieved
- Must understand which services are valued and deliver those services in an appropriate way that fits with workflow
Governance

- Appropriate governance is a critical factor for the HIE as it defines the roles and functions for the top management, determines organizational structure and operational strategy to achieve the objectives.
### HIE Governance Metrics

<table>
<thead>
<tr>
<th>Structure: Size and Composition (Board, Committees)</th>
<th>Coordination Mechanisms: Roles, Task Forces, designed to facilitate mission accomplishment and efficient operations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Representation coverage (All relevant stakeholders represented subject to size)</td>
</tr>
<tr>
<td></td>
<td>Leadership roles for key HIE value chain activities such as technology</td>
</tr>
<tr>
<td></td>
<td>Vertical structures in place</td>
</tr>
<tr>
<td></td>
<td>Lateral coordination mechanisms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Board “Governance IQ” (1)</th>
<th>Board Management Skills and Know How = Board Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Behavioral and Social Skills = Emotional Intelligence</td>
</tr>
<tr>
<td></td>
<td>Competency + Emotional Intelligence = High Governance IQ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Governance Attributes</th>
<th>Transparency in decision making processes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Degree of board engagement (continuous and extensive)</td>
</tr>
<tr>
<td></td>
<td>Trust among top management team members</td>
</tr>
<tr>
<td></td>
<td>Formalization of decision making policies (extent to which key decision processes are documented)</td>
</tr>
</tbody>
</table>
Governance @ DC RHIO

“...The RHIO is there because it has a fair amount of representation...”
“...convening disparate stakeholders and getting them to sign a participant agreement and get over and around the various privacy concerns...that is an accomplishment...”
”...have to give <DC RHIO Project Team> a huge amount of credit in bringing it on-line.”
“...I think they do a really great job; they are coordinating a really large effort...”

- DC RHIO Advisory Panel as horizontal coordinating mechanism and checks and balance
- Project team has utilized external resources and intellectual capital, such as bringing in a legal team when developing data use and data sharing agreements
- Governance processes have managed to navigate and execute agreements related to the highly sensitive and potentially contentious issue of data sharing
- Workgroups and task forces have been convened to take responsibility for specific vertical activities of the DC RHIO, such as technology, and the recently convened business planning workgroups around sustainability and governance
- A robust governance structure for the DC RHIO of the future are being constructed
Community Engagement

- Evaluates if the RHIO has been successful in engaging a sufficient number of participants to ensure a viable financial model.

### Community Engagement Sample Metrics

| Market Penetration | - Number of participating hospitals, physician practices and clinics, etc. (proportionate to total number in region)
|                    | - Number of participating HIE data use/provide/benefit organizations [e.g. laboratories, imaging practices, public health, payers, pharmacies, etc. in accord with strategic direction of respective RHIO (proportionate to total number in region)]
|                    | - Number of connected patient records (proportionate to number of patients in region)
|                    | - Number of participating physicians (proportionate to total number in region)

| Community Involvement | - Willingness to participate in improvement efforts
|                       | - General level of involvement
|                       | - Degree to which C-Level and senior executives of participants and stakeholders are engaged
|                       | - Unsolicited suggestions for improvement
Community Engagement @ DC RHIO

“...our missions are congruent and it would not make sense if we sat on the side and said ‘we’ll let them do their own thing’...”
“...our involvement with the RHIO is a reflection of the fact that we want to be good citizens and we want to be there if not at the moment of conception at least at the moment of birth so we can either help midwife this through or avoid having problems that could have been foreseen...”
“...we would share experiences so that we could capitalize on what we have each learned without having to reinvent the wheel...”

- System is live in two major hospitals and six clinics with another 2-3 hospitals and two clinics scheduled to be connected by 4th quarter 2010 - 1st quarter 2011*
- DC RHIO project has had involvement from representatives of complementary efforts such as the Children’s IQ Network and Patient Data Hub

*The 8 clinics represent 37 sites
Community Engagement @ DC RHIO

- DC RHIO Needs
  - Need to expand inclusion of private physician practices
  - Absent from the DC RHIO at present are the large clinical laboratories including Quest Diagnostics, LabCorp and others in the region
  - The payer community has been represented on the Advisory Panel, but did not meaningfully participate in business planning discussions
Public Trust

- High levels of public trust are the foundation for a sustainable and successful RHIO, for both:
  - Participating organizations exchanging data
  - Healthcare consumers

<table>
<thead>
<tr>
<th>Public Trust Sample Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existence of privacy policy</td>
</tr>
<tr>
<td>Communication of privacy policy</td>
</tr>
<tr>
<td>Nature of consent</td>
</tr>
<tr>
<td>Frequency of consent</td>
</tr>
<tr>
<td>Procedures for revoking consent</td>
</tr>
<tr>
<td>Quality of security precautions</td>
</tr>
</tbody>
</table>
Public Trust @ DC RHIO

- The successful execution of data sharing agreements is a signal of trust between the parties in the exchange
- Privacy principles developed and distributed in accord with Markle Foundation principles
- Security is closely related to privacy – Amalga VPN system and robust authentication is used
- DC RHIO uses “opt-out” - the policy implications of the varying consent mechanisms do not have sufficient evidence to be measured at present

Technology

- Technology component of the Assessment Model focuses on two distinct targets of evaluation:
  - Technical features of the solution
  - User acceptance & change management
Technical Features Sample Metrics

<table>
<thead>
<tr>
<th>Scalability</th>
<th>How easily can the volume of transactions, data, and connection partners be increased?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How long does it take for a new participant to be connected to the RHIO?</td>
</tr>
<tr>
<td></td>
<td>How long does it take to add a new user?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standards Alignment</th>
<th>Is the RHIO compliant with Meaningful Use and NHIN standards?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Can the RHIO connect to multiple proprietary systems?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range of Services</th>
<th>Can new services be added with ease?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Is the data architecture flexible enough to support multiple views of the data?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System Reliability</th>
<th>What is the uptime of the system?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Are adequate back up processes in place?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usability</th>
<th>Are the applications consistent with the workflows they support?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How usable is the system in its real-world setting? How compatible is it with existing workflow?</td>
</tr>
<tr>
<td></td>
<td>Is adequate data available and in the appropriate format for use?</td>
</tr>
</tbody>
</table>
## User Acceptance and Change Management Sample Metrics

| **Training** | How effective were the training processes?  
Are users able to utilize the tools with ease? |
|--------------|---------------------------------------------|
| **Adoption** | What proportion of intended users is actually using the system?  
What is the depth and breadth of system use (i.e., for how many transactions and across how many features)?  
To what degree do users intend to experiment with the system? |
| **Technical Support** | Have adequate support structures been instituted?  
How long does it take to respond to a user assistance request? |
Technology User Perceptions

- User perceptions of the ease of use of DC RHIO are generally positive, and significantly above a “neutral” response.
- Interviews also revealed that the interface was generally gauged to be easy to navigate.
Scores provided for the compatibility questions suggest that workflow impacts have been addressed during design and roll-out.

While respondents acknowledge that the system will change some of their work routines, the sample (n=45) of respondents do not believe that the change will be disruptive.

ED Doctors indicate issues with use of dual systems.
The DC RHIO project team held extensive training sessions pre go-live.

Respondents generally believe that they have had adequate opportunities to ask questions about DC RHIO and to have the questions addressed.

Reactions to the training received are largely positive, and users expect adequate technical support to be forthcoming.
Technology contd.

- Benefits of a more proactive or "push" system
- In developing a more usable HIE system, techniques that integrate HIE data directly with the EHR and can be accessed via the native system provide a goal to explore further
- A limiting factor affecting adoption is the requirement for [ED] doctors to leave their native system and click through multiple screens to access RHIO patient information
- The lack of data availability (or the user perception of this lack of availability) is a foremost issue
- There is a continued opportunity for services enhancement and additional data sources
Recommendations

- DC RHIO construct a hybrid revenue model that is based on revenues from subscriptions (that include a set of pre-determined services) as well as traditional fees paid for additional services
  - Need to secure commitments of willingness to pay from participants
- Expand the pool of participants across the healthcare value chain, most notably private physician practices, commercial laboratories, and other clinical data users and sources
- Improve the usability of the technologies and expand the services mix through innovation and user-centered design
- Ensure data integrity and availability
Recommendations contd.

- Develop governance mechanisms to ensure accountability and performance tracking following the principles of good governance
- Develop organizational capacity to achieve revenue and cost targets
- Institute a systematic and sustained monitoring and evaluation program
  - Such a program must include a hierarchy of metrics beginning with improvements in care quality and patient safety, public health benefits, and cost savings, and cascading down to intermediate metrics
Recommendations contd.

- Communications Planning and Execution
  - Plan for provider and patient education to develop public trust and confidence
  - Design communication mechanisms for partner organizations
  - Publicize the DC RHIO experience
In Sum @ DC RHIO

- DC RHIO has laid the foundation for health information exchange in the District, but much work remains to be done to leverage HIE to yield improvements in the health of the population, enhance the patient experience of care (including quality, access, and reliability); and reduce, or at least control, the per capita cost of care.
DC RHIO Leadership Perspective
Appendix
Semi-structured interviews (30)

- D.C. Primary Care Association: Sharon Baskerville, Executive Director; Donna Ramos-Johnson, Chief of Technology Operations
- D.C. Department of Health: LaQuandra Nesbitt, MD, Senior Deputy Director, Community Health Administration; Emil Parker, Health Care Program Manager; Lauren Ratner, Bureau Chief, Community Health
- D.C. Department of Health Care Finance: James Focht, Chief Information Officer and Administrator of D.C.’s State HIE Cooperative Agreement Program Award; LaRah Payne, Information and Privacy Officer
- Blue Novo: Roopak Manchanda, Managing Partner
- Bread for the City: Julia Eddy, Special Project Coordinator
- Children’s National Medical Center: Brian Jacobs, MD, Vice President & Chief Medical Information Officer
- Delaware Health Information Network (DHIN): Chris Manning, Director of External Affairs
- D.C. Chartered Health Plan, Inc.: Khalil Bouharoun, Senior Vice President & Chief Technology Officer; Robert Watkins, Chief Operating Officer
- Family and Medical Counseling Services: Flora Hamilton, DSW, Executive Director; Deborah Parris, Health Information Manager
- HealthBridge: Trudi Matthews, Director of Policy and Public Relations
- Michiana Health Information Network: Tom Lidell, Executive Director
- MedStar Health: Paul Shapin, Assistant Vice President of Decision Support Systems
- Microsoft Corporation: Garrett Clark, Customer Relationship Manager
- Georgetown University Hospital: Brendan Furlong, MD, Chief Medical Information Officer, Chief of Service, Department of Emergency Medicine
- George Washington University Hospital: Gretchen Tegethoff, Chief Information Officer
- So Others Might Eat: Mary Ann Sack, Assistant Executive Director
- Washington Hospital Center: Peter Hill, MD, Chief Medical Information Officer
- Whitman-Walker Clinic: Donald Blanchon, Chief Executive Officer; Jay DuBroff, Care Coordinator; Michael Hager, Director of Quality Improvement; Stephanie Letourneau, MD, Family Practice Physician; Deborah Goldstein, MD, Infectious Diseases Physician; Barbara Lewis, PA, Physician's Assistant; The Medical Assistants of Whitman-Walker Clinic
<table>
<thead>
<tr>
<th>Benchmarking</th>
<th>MHIN</th>
<th>HealthBridge</th>
<th>DHIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Model</td>
<td>Tiered subscriptions + ancillary services (interface deployment, quality, EHRs)</td>
<td>Tiered Subscription for unlimited data most services. Transaction fees for select services.</td>
<td>DE statute requires private sector matching funds from stakeholders. Working on a “sustainable model”.</td>
</tr>
<tr>
<td>Funding Origination</td>
<td>$200K, founding members 6 hospitals and laboratory</td>
<td>$1.75M loan, founding members 5 health systems and 2 health plans</td>
<td>$12M, federal and state grants</td>
</tr>
<tr>
<td>Core Services</td>
<td>Results reporting, “print efficiency”, community repository data sourcing</td>
<td>Clinical messaging and portal. Sends information including lab data, radiology/ADT information, demographics, admissions notices, discharge summaries, transfer notices.</td>
<td>Results delivery (EHR direct, clinical inbox, direct to fax), Patient search function</td>
</tr>
<tr>
<td>Funding, Current</td>
<td>Commercial Services (100%)</td>
<td>Commercial Services (100%)</td>
<td>Federal (1/3), State (1/3), Customers (1/3) *Legislated</td>
</tr>
<tr>
<td>Physicians</td>
<td>1,000</td>
<td>4,400</td>
<td>60% of providers currently practicing in DE (800+ est.)</td>
</tr>
<tr>
<td>Hospitals</td>
<td>~ 7 hospitals, 80+ total organizations</td>
<td>29 hospitals, 5500 physician users, 17 local health departments, 700 physician offices and clinics</td>
<td>3 health systems, adding 4th, 800,000 patient records</td>
</tr>
<tr>
<td>Keys to success</td>
<td>Accelerating the pace of benefit, broad and supportive constituency, adding data sources.</td>
<td>Push system value, Stakeholder Support</td>
<td>All the players at the table, Strong government support, limited geography</td>
</tr>
</tbody>
</table>
User Survey

- Online survey between April 7, 2010 and May 1, 2010.
- The survey was developed based on extensive research conducted by CHIDS in the past on technology acceptance and included validated scales for measurement.
- Total Number of responses: 45 / 240; Response Rate: 19%.