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Aligning Incentives with Both Quality and Health Information Capabilities:

Developing Sustainable Models for Health Information Exchange

Request for Proposal

Response

Submitted to

The eHealth Initiative Foundation
Connecting Communities for Better Health Program
Conducted in Cooperation with the
Health Resources and Services Administration

November 7, 2005

This information was submitted as part of a request for proposals to funders cited above. Standard forms, fiscal information and appendices submitted with this application are omitted from this copy. A complete original is on file at the Center for Healthy Communities and can be accessed by contacting Katherine Cauley, Ph.D. at the above listed address.

1. Executive Summary

The HealthLink Miami Valley RHIO (HLMV) began five years ago as the HealthLink Miami Valley Network, a multi-stakeholder collaborative of health and human services organizations focused on improving the health of the community through increased access to care, and better integration and coordination of care across public service sectors. This broad-based collaborative is fiscally housed at the Center for Healthy Communities, Department of Community Health, Boonshoft School of Medicine, Wright State University. Stakeholder identified strategies to achieve community wide goals included identifying health uninsured, assisting them in enrolling in Medicaid, and monitoring services utilization. To implement these strategies, stakeholders agreed to develop a community based health information exchange using a web based, non-federated model incorporating a central data repository and electronic shared records. Further they decided to use non-vended, commercially available products, and open source architecture/coding to insure accessibility and interoperability, and to operate as a subscriber based community rated public utility. Wright State University agreed to house the database, provide legal support and administrative structure, and funds from a Healthy Community Access Program grant (DHHS/HRSA) supported the initial investment of hardware, software design, and project management.

To date, HIEx™ (HealthLink Health Information Exchange) houses close to 20,000 records stored both individually and by household which include demographics, eligibility, out-patient services utilization and referral data, self reported chronic disease status, Medicaid and other public sector applications, and scanned documents supporting these applications. User access to HIEx™ is through a VPN and assigned role, each user/organization is responsible for the accuracy of entered data, and HIEx™ provides a real time date, time and viewer/user audit trail. Since this is the first web-based system available in the community, most users/organizations are currently maintaining client/patient data on both HIEx™ and their own paper or in house electronic systems. However, as functionalities and services available in HIEx™ have increased, users are increasingly shifting data management to HIEx™.

Over the past several months the focus of health information exchange has begun to be centered on children. Current HIEx™ users/organizations--all in the category of health and human services providers--including child protective services, public schools, public health department, the children's hospital, and kinship care services and Medicaid/CHIP outreach programs (both housed at the Center for Healthy Communities at Wright State University) have developed an interest in expanding HIEx™ to include components of a Community Child Health Record. HLMV project staff have been exploring the utility of the CCHR with new and existing stakeholders, and there is strong consensus to use the CCHR as a strategy to shift the focus in the community from organization centric health information technology development to patient centric health information exchange development. Stakeholders are interested in both expanding the numbers of physicians using health information technology, and demonstrating the value of health information exchange as a means to document improved quality of care.

With our payers and purchaser partners HLMV wants to tackle the question, "how can collaborative HIEs facilitate ambulatory performance measurement data to support quality improvement for MDs and information needs of payers to demonstrate value?" In order to begin to answer the question for the Dayton community, support from the eHealth Initiative

Foundation will be used to: model the value and benefits of health information exchange for stakeholders using existing and newly developed HIEx™ capabilities; increase stakeholders involvement in developing strategies to align payment systems, quality and efficiency goals with health information exchange; and demonstrate the viability of the subscription based, community rated business model create a business model for long term sustainability using standard business evaluation criteria.

Business principals must be applied to this question, articulated and used to redesign incentives and other reward structures and to disseminate lessons learned. Investigation of the best method to align incentives with improved quality of care and to enhance adoption of health information technology must be grounded in practice. To date incentives have been monetary and research has shown that rewards must accrue to the individual and must be seen as equitable to be effective. In responding to the need to investigate this research question, HLMV proposes to develop a reward structure that is organic and does not require immediate systemic realignment. The hypothesis behind this learning laboratory is that our health care community has developed consensus around the need for a shared electronic Community Child Health Record. After proof of concept, any system that effectively responds to market demand can be sustained by ongoing support of customers who are getting the service that they want. Using this learning laboratory we will model a template that can be transferred to other communities at very low cost and can have the net effect of market driven system improvement.

2. Project Information

The HealthLink Miami Valley RHIO (HLMV) began five years ago as the HealthLink Miami Valley Network, a multi-stakeholder collaborative of health and human services organizations focused on improving the health of the community through increased access to care, and better integration and coordination of care across public service sectors. Fiscally housed and staffed by the neutral convener, the Center for Healthy Communities at Wright State University, the governing structure of the collaborative involves a steering committee, task forces, and ad hoc committees through which the work of the project gets done. In order to facilitate open communication across such a broad collaborative effort and to encourage use of the Internet as a resource HLMV maintains a public website which holds all routine project documentation including meeting times, dates and minutes, reports, surveys, grant proposals, information sharing and business associate agreements, and application to gain access to the VPN access for the HIEx™ training and production sites (www.med.wright.edu/healthlink/). Open communication and shared leadership are further enhanced through regularly scheduled meetings of project workgroups, standing meeting agendas, and rotating meeting facilitation responsibilities. Decisions are made by consensus and all members of HLMV have veto power.

Existing and ongoing project support and participation from all organizations involved in HLMV is evident though participation in the HLMV Network and Task Forces/Work Groups and community-wide interest and investment in project goals and activities. Data from a partnership survey developed by the New York Academy of Medicine and administered to HLMV members in January of 2002 and again in May of 2003, document the value of the collaborative to member organizations. For example, in May 2003, members reported: 1) they had more authority to commit organizational resources to the collaboration; 2) there were better working relationships between organizations; 3) there were more opportunities to express and resolve conflicts among

members; and 4) there was increased satisfaction with success of the collaboration. HLMV membership represents the majority of health and human services providers in Montgomery County, a partial listing of which appears below.

Organization	Representing
Alcohol Drug Addiction and Mental Health Services Board (ADAMHS)	Payer
Anthem	Payer
CareSource	Payer
Children's Medical Center	Hospital
Children's Services Board	Clinicians
Dayton Area Chamber of Commerce	Business
Dayton Public Schools	Clinicians
East End Community Center	Consumers/ patients
Emergency Food Bank	Consumers/ patients
Gem City Medical, Dental and Pharmaceutical Society	Clinicians
Goodwill	Disabled consumers
Greater Dayton Area Hospital Association	Hospitals
Kettering Medical Center Network	Hospital
Maranatha Christian Fellowship	Faith Based organizations
Miami Valley Health Improvement Council	Community
Miami Valley Health Ministries Association	Faith Based organizations
Miami Valley Hospital	Hospital
Montgomery County Combined Health District	Public health
Montgomery County Family & Children First Council Office	Local government
Ohio Department of Jobs and Family Services	State of Ohio
Ombudsman	Consumers/ patients
Reach Out Montgomery County	Volunteer Clinicians (Free clinic)
Samaritan Homeless Clinic	Clinicians
Shelter Policy Board	Homeless consumers/patients
Sinclair Community College	Education
Sunrise Center	Provider
The Dayton Foundation	Philanthropy
Tri-River Health Care Initiative	Employers & payers
Unified Health Solutions	Pharmacy program
United Way HelpLink	Provider
University Medical Services Association	Physicians
Wright State University	Clinicians & education

Leadership and Commitment

HLMV leadership for the local initiative has remained constant from the beginning, successfully engaging representation from all other health information technology (HIT) efforts in the community, and to maintain a dialogue on the regional health information infrastructure. Project

leadership has also been involved in state and national HIT efforts. Following the HIT Summit launching the Office of the National Coordinator of HIT in 2003, HLMV, in conjunction with the Health Policy Institute of Ohio, and Ohio KePRO, organized the first Ohio HIT Summit which included keynote speaker Jonathan Javitt from the Presidents Information Technology Advisory Committee. HLMV served on the steering committee for the second statewide meeting, the Ohio Health Information Technology Symposium, supported by the eHealth Initiative and the Health Policy Institute of Ohio in October, 2005. HLMV leadership staff was also a key informant in Ohio interviewed for the report, Assessing Health Information Technology in Ohio published by the Health Policy Institute Ohio.

On the national level, HLMV has been: working with representatives of the Office of the National Coordinator for Health Information Technology and the Veterans Health Administration Office of Health Information Architecture; serving on the HL7 Association Ambulatory Care Electronic Record Committee, the eHealth Initiative Connecting Communities for Better Health Learning Community, and the American Society for Testing and Measurement EHR E-31 Committee; and HIEx™ was cited as one of two Ohio systems included in the report, Emerging Trends and Issues, the Second Annual Survey of State, Regional and Community Based Health Information Exchange Initiatives and Organizations, published by the Health Resources and Services Administration of the US Department of Health and Human Services. HLMV has made peer reviewed presentations about the work of the collaborative and HIEx™ at numerous national meetings including the American Public Health Association, Academy Health Annual Research Meeting, and the American Medical Informatics Association.

Breadth and Depth of Stakeholder Engagement

All HLMV members are engaged in the health information exchange through HIEx™. Over thirty health and human services organizations including hospitals, and public health clinics have been providing client/patient data to HIEx™ which is included in individual and household level records. Five programs from four separate organizations are using an electronic shared record through HIEx™—Children Services Board, Dayton Public Schools, Combined Health District, and the Kinship Care Services and Medicaid Outreach Programs at the Center for Healthy Communities. In order to further engage payers and purchasers in developing strategies to align payment systems, quality and efficiency goals with health information exchange, we need to expand the number of health information exchange participants, and in order to expand participants we need to expand the capabilities of HIEx™, as described below. HLMV member organizations will work through existing HLMV governance structures to develop and demonstrate a community based solution that will utilize health information exchange to improve the quality of health care while engendering widespread adoption by practicing clinicians. While all HLMV members are involved in ongoing health information exchange development, letters of support from a specific group of partners to demonstrate commitment to identified next steps are included below from: Anthem Blue Cross Blue Shield of Ohio; CareSource (Medicaid Managed Care); the Health Policy Institute of Ohio; Children's Medical Center; the Dayton Primary Care Practice Based Research Network; HTP Healthcare Transaction Processors; the Combined Health District of Montgomery County; Dayton Public Schools; and Montgomery County Children Services Board.

Overall project leadership will be under the direction of: Principal Investigator, Mary Crimmins, MA, CPEHR, CPHIT, who serves as a Research Associate with the Center for Healthy Communities, and as the HIEx™ Project Manager, and Co-Chair of the HLMV Management Information Systems Task Force; Co-Principal Investigator, Arthur Pickoff, MD, who serves as Professor and Chair, Department of Pediatrics, Boonshoft School of Medicine, and Co-Chair of the HLMV Outcomes and Evaluation Task Force; Co Principal Investigator, Kate Cauley, PHD, who serves as Associate Professor and Director of the Center for Healthy Communities, Department of Community Health, Boonshoft School of Medicine, and Director of the HLMV Regional Health Information Organization; and Co-Principal Investigator, Robert Sweeney, PHD, Professor of Finance, Raj Soin School of Business, who serves as Business Evaluation Director for HLMV. Under their leadership, using existing HLMV workgroups, the work of the project will be conducted as described below.

The current HLMV Management Information Systems Task Force which includes David Roberts, Software Engineer, a TBN Programmer, and IT Directors from HLMV member organizations, will work with HTP Healthcare Transactions Processing, and the WCI at Wright State University to expand HIEx™ capabilities. Working with resources such as Ohio's immunization registry, public domain tools through the CDC, the Indian Health Service, emerging standards, and other open architecture programs across the country, they will develop the immunizations, medications and allergies modules, the primary care face page and access through HIEx™ to e-prescribing for HLMV members. They will work closely with the Outcomes and Evaluation Task Force, which includes a cadre of physician members who insure that components of HIEx™ are designed with clinical soundness, patient centricity and workflow considerations. The current Outreach Task Force which includes existing and new health information exchange participants will work to expand providers using HIEx™, coordinating training activities and identifying areas for integration with existing HIT efforts. Parallel to these processes, working through the HLMV Strategic Planning Task Force Dr. Sweeney will engage principals from purchasers/payers, providers and consumers focused on rethinking incentives for HIT adoption, and payment mechanisms for health care quality and outcomes. Key participants will include Tom Hickey, CEO of Tri River Employers Healthcare Coalition with experience in purchaser driven incentive systems; Tom Murphy, MD, MPH, Vice President for Medical Affairs, Children's Medical Center; Paul Beckman, FACMPE, Vice President, Southern Ohio Health Service Area, Anthem Blue Cross Blue Shield; Pam Morris, CEO of CareSource, a Medicaid Managed Care organization; Tom Hershline, MD, Interim Medical Director, Combined Health District of Montgomery County, Brian Bucklew, CEO, Greater Dayton Area Hospital Association, and Phil Parker, CEO, Dayton Area Chamber of Commerce.

Readiness of HIE Capacity

The readiness of the health information exchange supported through HLMV can be assessed based on the current data captured and exchanged, the number of organizations involved, the technical capacities of the system, the best industry practices used to build HIEx™, and the open source philosophy that underpins development. Four separate organizations are now using HIEx™ to electronically exchange eight types of data including: demographics, disease information, eligibility, service utilization, referrals, patient reported data, dictated notes, and scanned documents. Exchange participant organizations include Montgomery County Children Services Board, Dayton Public Schools, Combined Health District of Montgomery County, and

the Kinship Care Services and Medicaid Outreach Programs at the Center for Healthy Communities.

The system has a current capacity of 1500 concurrent connections over the VPN (virtual private network) and has a current storage capacity of 102 GB. In anticipation of a growing number of physician offices, pharmacies and other organizations using HIEx™, additional equipment has been requested in the budget to provide redundant servers, software for interoperability with standards based applications that will permit us to provide 24/7 service. While we strive for 24/7 the present users of our system do not require that type of access and additional equipment will be needed to assure access.

Grant support will allow us to add outpatient visits, outpatient prescription, pharmacy, immunizations, allergy lists and a cover sheet. Since the early stages of the HIEx™ system, national technical standards and HIPAA recommendations pertaining to privacy and security concerns in relation to IT were adopted as best practices and have been featured throughout its design and implementation. Data encryption, secure connections, system backup, policies and procedures, inter-agency agreements are some of the provisions adopted. The use of XML object serialization and support of XML schema can be used to interface data from different systems that support the XML standard. The HIEx™ system can also adapt a larger, industry-standard schema to the needs of a specific kind of industry form to ensure interoperability not only among company records across several platforms and applications, but also to provide reliable, controllable, business-to-business data exchange.

HIEx™ has been developed using Microsoft's .NET, MS SQL stored procedures, and client script programming languages. All the source code complies with open-source and non-proprietary guidelines established by the HLMV MIS Task Force. HIEx™ business rules are reflective of Elliott Stone's philosophy of "radical incrementalism" that establishes a priority on building block components for the system. The development cycle is reiterative with functionality built in the development environment, pushed out to the staging site, field tested on that site, debugged and put into the production environment. Revisions are then made based on user feedback throughout the cycle.

3. Proposal Narrative

The process of aligning incentives with both quality and health information capabilities needs to progress incrementally and be directed by stakeholder identified need. For example, in Montgomery County, health and human services providers were dissatisfied with their ability to identify and enroll clients/patients eligible for Medicaid. Additionally, multiple providers working with the same population of underserved members of the community recognized the duplication of effort involved in documenting client/patient information at each site. Although very few of the stakeholders routinely kept client/patient data in electronic records, they were all familiar with HIPAA and concerned about compliance with the new regulations. Through HLMV they determined a registry of health uninsured, available over the internet as an electronic shared record with demographics, eligibility, services utilization and chronic disease diagnostic data would respond to their concerns. With support from the Health Resources and Services Administration, the HIEx™ system was developed, and we were able to offer an initial incentive period when access to HIEx™ was free of charge to interested stakeholders. Once a of

proof of concept period had been completed, health and human services agencies had become familiar with maintaining the electronic record, had come to value the utility of the central data repository model and began paying for subscriptions to the health information exchange.

The quality measures identified by stakeholders in this first phase of health information exchange revolved around access to care and Medicaid enrollment. For example, over an eighteen month period we were able to demonstrate that among health and human services organizations using HIEx™, Medicaid enrollment rates increased were 45% compared to general Medicaid enrollment rates of 25%, and this generated significant levels of revenues for providers offsetting the high rate of uncompensated care provided in the community. Additionally stakeholders reported overall better coordination of service across provider organizations. Based on this demonstrated success, multiple additional stakeholders in the community became interested in expanding their work with Medicaid enrollment and care coordination through HIEx™. A large hospital system has begun paying for health information exchange adoption by supporting their providers to use HIEx™.

Today, a large number of HLMV stakeholders actively engaged in health information exchange through HIEx™ have as their client/patient focus, children. Increasingly they are calling for additional data sharing opportunities. For example, children receive immunizations at multiple points of care including school based clinics, community health centers, public health clinics, hospital emergency departments, and pediatrician practices. This results in repeated immunizations which involves unnecessary duplication of services, health risks, and increased costs (Yusuf, et al. 2000). HIEx™ users want a summative immunization module to provide quick and accurate to access the child's immunization history. Additionally, they are interested in a primary care face sheet. With a primary care face sheet providers could have an immediate and complete view of the health status and issues for the children in their care. Users also want templates for allergies and medications, and e-prescribing capabilities in order to better monitor compliance of treatment regimens and to reduce errors related to prescribing. They have determined that extending HIEx™ functionalities to include components of a Community Child Health Record for the greater Dayton area would begin to respond to their concerns.

Clearly as children interact with providers in multiple settings, often without ready access to their parents, they are not as capable of providing the same type of self-report information related to their health and health care that adults can provide. Imagine a case of allergies, medical fragility, even something so routine as an asthma attack; the evaluation of these situations and subsequent intervention is information dependent. While studies reviewing the Parental/Child Health Record implemented in Great Britain since 1991 demonstrate increased quality of care improvement and customer satisfaction (Hampshire, Blair, et. al. 2004), implementing a CCHR electronically would respond to the weaknesses identified including missing data in emergency medical consultations, and when working with at risk children and children with multiple disabilities, particularly those with low socioeconomic status (Knowles, Blackburn et al. 1999).

The HIEx™ system is built to group individuals in households and to delineate relationships among members and is well suited to the CCHR as it meets the requirements set forth by the American Academy of Pediatrics "to facilitate care that is accessible, family-centered, continuous, comprehensive, coordinated, compassionate, and culturally effective…to compile

and centralize all pertinent information related to a child's medical and non-medical care so as to ensure that optimal pediatric care is provided." (2000). While the need for pediatric records are important, sharing a health record across organizations, i.e. health information exchange, shows the greatest cross sector benefit.

Again, working incrementally, we will expand HIEx™ users and expand HIEx™ functionalities in response to stakeholder identified need. With support from the eHealth Initiative we will develop the requested additional capabilities of the system and provide the incentive of initial access to HIEx™ for new users free of charge, further increasing health information exchange adoption particularly among small physician practices and payers and demonstrating proof of concept for all stakeholders. At the end of the pilot period a critical mass of stakeholders who routinely deal with children through pediatricians offices, the schools, the public health department, children's protective services, kinship care and Medicaid outreach services, commercial and Medicaid insurers, and the children's hospital in the community will have demonstrated the value of health information exchange through an electronic ambulatory health record for children. During the pilot period, stakeholders will work together to establish standard quality and performance measures facilitated through HIEx™ utilization such as increased access to care, increased coordination of care, increased immunization completion rates, decreased administrative costs, and decreased duplication of services. Additionally stakeholders will work together to determine appropriate incentives for further health information exchange adoption, and develop a plan for shared support of ongoing subscription fees for HIEx™.

Impact on the Community/Awareness of Individual Market Dynamics

The ancillary benefit of this incremental, stakeholder responsive approach to instituting a health information exchange is to support the gradual migration to electronic records and health information technology community wide. HIEx™ is designed to be the public sector and outpatient component of a comprehensive regional electronic health information infrastructure that facilitates standards based electronic communication and real time sharing of electronic health records across multiple providers. As such we have been working with the multiple HIT initiatives in the community. Large hospital systems are investing in enterprise level vended products. Physician practices contract with claims transactions services, and some are using practice management systems. Two physician practices in Montgomery County are involved in an e-prescribing pilot administered by the University of Findlay. The public health department submits vital statistics and some immunizations data to the state health department through electronic communications. However, epidemiologic disease reporting and communications with physician offices locally is still by fax or snail mail. The homeless coalition organizations use a HUD prescribed vended system to monitor the homeless population. As we review the HIT landscape however, we note that hospitals still view data as proprietary and are not yet discussing data sharing; an environmental scan conducted by Ohio KePRO estimated less than 10% of Ohio physician practices have fully adopted electronic health records (HPIO, 2005); and we have the usual wide variety of vended and home grown systems with varying levels of adherence to existing or emerging standards, and limited capacity for interoperability without complex builds of middleware.

From this review it is clear that the local market mirrors communities across the US—with one exception. In the Dayton community we have HLMV with representation from all of the efforts

described above, and we have a functioning health information exchange. In the not too distant future, the functionalities and business rules of HIEx™, particularly the commitment to standards, interoperability and open architecture products, as well as the significant level of client/patient data resident in the system, will be a valuable resource to the multiple HIT efforts underway in the community.

Montgomery County Ohio, population 550,063, is the geographic site of HLMV. Located in west central Ohio, Montgomery County's center city is Dayton with a population of 161,696 and 23% of the city's population lives below the federal poverty level. In the whole of Montgomery County (including the City of Dayton,) those living in poverty is 11%, and the rate of health uninsured is 11.7% representing 64,357 individuals. The percentage of residents under the age of 18 is equally distributed in the city and the county at 25% of the population. The largest occupational industry sector in the County is Education and Health (23%) followed closely by Professional (18%), Manufacturing (16%0, Service (15%), Retail (13%), Transportation (5%), Construction (5%) and Other (5%). There two major hospital systems and one children's hospital in the county, and 756 primary care physicians.

For this next phase of HLMV development with requested support from the eHealth Initiative Foundation, we are defining covered lives as residents of Montgomery County, and further targeting the population of children. We have engaged purchasers/payers responsible for 33% of all covered lives in Montgomery County and 49% of covered lives in the targeted group, children (Total Montgomery County population, 550,063 of which 137,516 are children; Anthem serves 145,513 Montgomery County residents of which 33,007 are children, and CareSource serves 40,000 Montgomery County residents of which 33,755 are children—143,513 + 40,000=183,513/550,063=33% of all covered lives in Montgomery County; and 33,007 + 33,755=66,762/550,063=49% of targeted covered lives, children in Montgomery County. Additionally, we have engaged the commitment of 70% or 531 of the 756 practicing primary care physicians in Montgomery County. involved in the project (375 PC physicians on Anthem's provider panel, and 156 PC physicians on CareSource provider panel—375 + 156=531/756= 70%)

HIEx™ is also poised to serve as an applications software provider for subscribers accessing resources available in Ohio, regionally and nationally. In Ohio there are a wide range of activities from the two Cincinnati based projects, HealthBridge providing a central lab results repository, and Ohio Shared Information Services providing practice management and quality review for FQHCs, to a Cleveland based initiative focused on disease management in diabetes. HLMV has recently partnered with HTP, a Columbus based transactions processing company, and HLMV works directly with the Wright Center for Innovation at Wright State University—part of the statewide Third Frontier Initiative which is developing advanced data management. The Wright Center for Innovation is developing products in partnership NCR's Teradata Division that recently began working with CMMS on Medicare Part D transactions.

Impact on the Field

HIEx™ is designed to be accessible, and easily replicable in communities across the country. HLMV is one of only a few public sector RHIOs modeling a structure for both public and private subscribers, a commitment to an open source architecture and design, a focus on ambulatory care

across health and human service sectors, and the expectation that subscribers will participate in a central data repository. Particularly useful both for organizations serving clients/patients whose eligibility for service is tied to household factors such as income, and for clinicians who are working with multiple members of one family, HIEx™ maintains client/patient records both individually and as a part of a household unit.

A standards based system, HIEx™ uses role-based access, which readily facilitates multiple user access to a client/patient record while protecting access to certain kinds of information as required by federal and state law. Each bit of data resident in HIEx™ is time, date and user stamped to insure security and facilitate accountability among multiple users of a central record, while insuring that the records can be readily and routinely updated. HIEx™ was built with the idea of extensibility in mind, providing a way for developers to easily add portal modules that respond to evolving needs and are integrated into the basic framework**.**

All of these features support the national goals of informing clinical practice, connectivity, personalizing the record, and improving population health. Additionally, standard barriers to HIT adoption such as cost are mitigated by the open architecture design. Finally, although the Indian Health Services has developed a pediatric electronic health record, we are not aware of another community where the Community Child Health Record is being used through and electronic health information exchange in the US.

We see HLMV as making a strong case for communities to begin their efforts to develop a health information exchange at the point where they perceive there will be the greatest impact on the improvement of the health of the community. We have been able to demonstrate the value of health information exchange, particularly for health uninsured individuals who seldom seek preventative or primary care, and instead access episodic emergent care. Our focus on health uninsured has placed access as a top quality indicator, and demonstrated how increased access can reduce uncompensated care increasing revenues for stakeholders. A web-based standardized electronic infrastructure with the capacity to: provide better management of chronic disease and less inappropriate use of emergent care services; insure that providers have the right information at the right time in the right place to support coordination and integration of care; and a data pool, which in the aggregate can be used for improvements in population based health, and more accurate planning for distribution and use of resources, is a valuable resource in the field.

Impact on the Gulf States

The aftermath of hurricane Katrina highlights the need for electronic records and for the merger of records from multiple sources into one patient record. As a web-based application HIE™ neutralizes the effect of location and could be used today by health care providers to record patient centric data from existing systems. Features readily transferable to the Gulf States in HIEx™ include: HIEx™ can capture demographic information, referral information and scanned documents; the contact record provides a place to capture emergency contact information, primary care physician, hospitals used; the address history is a simple way to track location of individuals as well as contact information; the referrals module could be used by FMEA to track what they have done with individuals.

4. High-Level Work Plan including Key Deliverables and Milestones

There are three primary components to be completed in the twelve-month grant period. First we will model the value and benefits of health information exchange for stakeholders using existing and newly developed HIEx™ capabilities. Second we will increase stakeholder's involvement in developing strategies to align payment systems, quality and efficiency goals with health information exchange. Third we will demonstrate the viability of the subscription based, community rated business model create a business model for long-term sustainability using standard business evaluation criteria.

Model the value and benefits of health information exchange for stakeholders using existing and newly developed HIEx™ capabilities

HIEx™ has demonstrated value to public sector service providers who, prior to HIEx had little to no electronic record keeping capacity, by increasing access to health care services for their clients/patients, increasing coordination of care, reducing administrative costs, and reducing uncompensated care costs. Currently, there is enough interest among stakeholders throughout the community to that they are beginning to recommend ways that HIEx™ can be more responsive to a broader constituency of subscribers. In order to take advantage of this momentum in the local marketplace, it is important both to provide additional capabilities through HIEx™ and to provide a low risk environment for new subscribers interested in testing out the product. With support from the eHealth Initiative Foundation, an infusion of software design effort will quickly expand HIEx™ capabilities, paving the way for expanding participants in health information exchange. Access to HIEx™ free of charge for a pilot period will serve as a powerful incentive for health information exchange adoption. Significant milestones to be monitored include documenting an increase in the number of providers using HIEx™ with its current capabilities who are using HIEx free of charge, documenting an increase in the number of providers using HIEx™ with its current capabilities who are paying a subscription fee to use HIEx™, completion of new capabilities for HIEx™, documenting the number of providers using the new capabilities who are using HIEx™ free of charge, documenting the number of providers using the new capabilities who are paying a subscription fee to use HIEx™, and documenting the increase in the number of client/patient records resident in HIEx™. Additionally, subscribers will be regularly queried regarding changes in workflow, and perceived as well as accurate advantages and disadvantages of participating in the health information exchange. Finally quality measures related to access, care coordination, administrative burden and uncompensated care costs will continue to be assessed The end of the project period deliverable will be a report documenting the progress, and lessons learned, clearly articulating a road map for other communities to follow building incrementally a public sector health information exchange.

Increase stakeholders involvement in developing strategies to align payment systems, quality and efficiency goals with health information exchange

Health information exchange through HIEx™ has a demonstrated track record in facilitating quality improvement, efficiency, and return on investment. The next step is to involve purchasers, payers and providers is developing strategies to align payment systems with quality and performance measures valued by providers, and to use health information exchange to present quality and performance reporting. Significant milestones to be monitored will include high level participation from key stakeholders, consensus around at least five quality measures that can be applied to data resident in HIEx™, which would not be readily available without an

operational health information exchange, and which go beyond information currently available in claims data, consensus around at least five performance measures and their correlation to the above quality measures, and consensus around specific incentive structures for demonstrated performance and quality and health information exchange. The deliverable is a toolkit describing a successful community based process involving all stakeholders in the work of determining: 1) community wide quality measures that can be used to reward performance; 2) a model for sharing fiscal responsibility across all stakeholders for the implementation of a health information exchange; and 3) the best methodology for identifying stakeholders and completing a community wide process for aligning quality and performance with widespread adoption of health information technology.

Demonstrate the viability of the subscription based, community rated business model for long-term sustainability using standard business evaluation criteria.
During the project period we will be significantly expanding the number of subscribers and stakeholders using HIEx™ as well as expanding the capabilities of the system. We are in the process of validating and will continue to validate the subscription based community rated business model for a successful health information exchange on an ongoing basis. Specific components of the model, however, are just beginning to be tested. For-example, what kind of a pricing structure should be established to "sell" HIEx™ to other communities who are not interested in becoming application software customers? Additionally, what kind of ongoing relationship would be appropriate for other communities who use HIEx™ as it is configured when they purchase it in terms of open source/architecture upgrades completed either by HLMV or other RHIOs using HIEx™? These and other questions need to be answered in the context of the business rules adopted by HLMV. The lessons learned they not only will have utility for other RHIOs operating in similar contexts, but will also contribute the filed by articulating a new model which can be adapted in other communities. This component of our project is a self study where we will document the new relationship established as other communities begin to work with HIEx™. The deliverable will be a template for a business model that is subscription based, community rated and abides by the same business rules as HLMV.

Commitment of Project Leaders to Sharing Lessons Learned

HLMV leadership and members have demonstrated a commitment to sharing lessons learned since the inception of the project. Providing on average, two presentation/demonstrations a month locally, and presentations/demonstrations at multiple statewide and national meetings, as well as writing numerous articles about the health information exchange are just a few examples of this commitment. Currently, HLMV is marketing HIEx™ statewide in Ohio through both the Public Children Services Organizations and the Ohio Department of Health cardiovascular health education program. We are in consultation with Physicians for Connectivity in Chicago, Illinois, a new HCAP program in Waterbury, Connecticut, and a nurse practitioners office in New York City about the possibility of each of these groups become subscribers to HIEx™. In these interactions, we monitor obstacles to replicability and use, making modifications as necessary.

HLMV leadership is commit to involvement with the eHealth Initiative Foundation both through the Connecting Communities for Better Health and through state and regional meetings to develop tools and resources for use across the country. Additionally, a number of our partners have regional and national audiences and projects underway in other communities who may

benefit from lessons learned in southwestern Ohio. For example, HTP has over sixty customers nation-wide, and Anthem Blue Cross Blue Shield is part of the nationally distributed Well Point corporation. Success with a health information exchange as modeled in Dayton Ohio will provide important recognition for partner organizations.

Sustainability

HLMV is currently supporting a sustainable health information exchange which is providing utility for multiple subscribers and facilitating quality improvement and return on investment for stakeholders. To date the sustainability has been reliant on a combination of grants and contacts, in-kind support and subscription fees. In this building and development period of HLMV, we are still in need of investment to facilitate future growth, and have not yet reached the tipping point where we break even and are able to balance the need for investment and growth with revenues generated from operating the health information exchange, not unlike any other entrepreneurial endeavors. However, we are confident that the community based stakeholder approach to reaching consensus around shared responsibility for payment mechanisms to support health information exchange adoption, and quality and performance measures will prove to be the key to long term sustainability both for our program and for other programs across the country. The learning laboratory will bear this out.

5. Overview of Applicant Organization

Wright State University is a Non-Profit Educational Institution and is an Instrumentality of the State of Ohio, Federal identification number 31-072831. The organization at the nexus of HLMV is the Center for Healthy Communities (CHC) www.med.wright.edu/CHC/, a nationally recognized community-academic partnership (American Academy of Medical Colleges Community Partnership Award--1998, Community Campus Partnerships for Health National Award--2003), founded in 1989 and committed to improving the health of the community and health professions education. CHC is funded by federal, state and private grants and contracts with an annual budget of $1.3 million dollars. CHC staff work in concert with the Dayton community to tackle systemic public health problems, research policy and practice issues, and provide technical assistance, program evaluation and continuing education for health professionals. In addition to HLMV the CHC has established and sustained multiple local, state and regional collaborations and facilitated project planning and implementation in response to community identified needs. The Center has earned a reputation among community and academic partners as an ethical organization with both neutrality and expertise. The CHC is fiscally housed as a Division in the Department of Community Health, Wright State University Boonshoft School of Medicine (WSU/BSOM). Administratively, the CHC resides in the College of Nursing and Health, the Department of Social Work, and the Schools of Medicine and Professional Psychology at Wright State University, and in the Division of Allied Health technologies at Sinclair Community College, and the CHC Director reports to the Deans Advisory Board composed of deans from the above mentioned colleges, departments and schools. Additionally, the CHC is guided in program and policy decisions by the Community Advisory Board with representatives from health and human services agencies in the community, city and county government, faith-based organizations and public health, housing and education organizations in the greater Dayton area.

6. Key Contacts

Mary Crimmins is the Principal Investigator. She can be contacted by e-mail at mary.crimmins@wright.edu, by telephone at 937 775 1122, by FAX at 937 775 1110, and through the postal service at Center for Healthy Communities, 140 East Monument Avenue, Dayton, Ohio 45429.

William Sellars, PHD, represents the fiscal agent for the project, Wright State University. Dr. Sellars can be contacted by e-mail at william.sellars@wright.edu, by telephone at 937 775 2425, by FAX at 937 775 3781 and by postal service at Office of Research and Sponsored Programs, Wright State University, 3640 Colonel Glenn Highway, Dayton, Ohio 45435.