

Improving Health and Healthcare in North Carolina by Leveraging Federal Health IT Stimulus Funds

Health IT (Information Technology) Strategy for:

- *Electronic Medical Records (EMR)*
- *Health Information Exchange (HIE)*
- *Enabling Laws and Policies (Quality)*

A Report From the

North Carolina

Health Information Technology Strategic Planning Task Force

June 24, 2009

LETTER FROM THE CHAIR

We take information technology for granted. We think nothing of sending digital photos of our loved ones to aunts and uncles in another state. We routinely do personal banking at ATMs around town, across the nation or even in a foreign country. We can file our taxes online, look up contact information for long lost high school classmates, and communicate instantly anywhere in the world through e-mail, texting and twitter. Just about every aspect of our lives benefit from an ever expanding use of electronic information, why not our health information?

The reason most often cited for lack of progress is that sharing personal health information is too complex and too risky. When in fact the technology already exists that allows consumers to protect and share sensitive personal data. Expanded use of HIT has the potential to transform healthcare. Wouldn't it be great if:

- critical lab values arrived at the hospital before you reached the emergency department;
- you had an accurate list of medications every time you needed it;
- you didn't have to repeat expensive medical tests just because they were done for a different provider;
- there was an electronic back-up of your medical record that was lost in a flood;
- you could send your child's pertinent health information, including immunization records, to summer camp instantly; and,
- you could get ready access to current health information on an elderly parent in a nursing home in another town.

All of this and much more is possible but it will require a concerted effort on the part of providers, health facilities, health plans, consumers, and state leaders. The HIT Strategic Planning Task Force examined what it will take for such a "system" to be successful in NC beginning with a newly appointed high level HIT Coordinating Committee. The ARRA federal stimulus funding can help NC get started quickly but additional resources, public and private, will be required to reach our full potential.

I want to acknowledge and thank the members of the HIT Task Force, the subject matter experts, and the excellent staff for their hard work and expertise preparing the report. NC is fortunate that we have such strong leadership and existing organizations to help us rapidly achieve major advances in HIT. This report is a blueprint for success.

Sincerely,



J. Steven Cline DDS, MPH
Deputy State Health Director
NC DHHS
Chair, HIT Task Force

Improving Health and Healthcare in North Carolina by Leveraging Federal Health IT Stimulus Funds

Table of Contents

	<u>Page</u>
Executive Summary	5
Introduction	9
Background	10
Shared Vision for HIT in North Carolina	12
Unique North Carolina Partnerships—Competitive Advantages	14
Consumers Acceptance	15
• Guiding Principles	
• Summary of Existing Capacity and NC Expertise	
• Recommended Action Steps	
Privacy and Security	18
• Guiding Principles	
• Summary of Existing Capacity and NC Expertise	
• Recommend Action Steps	
Healthcare Delivery	21
• Guiding Principles	
• Summary of Existing Capacity and NC Expertise	
• Recommended Action Steps	
Population Health	28
• Guiding Principles	
• Summary of Existing Capacity and NC Expertise	
• Recommended Action Steps	
Financing and Sustainability	33
• Guiding Principles	
• Summary of Existing Capacity and NC Expertise	
• Recommended Action Steps	
Governance and Operations	36
• Guiding Principles	
• Summary of Existing Capacity and NC Expertise	

	<u>Page</u>
<ul style="list-style-type: none"> • Recommended Governance Structure 	
NC HIE Technical Architecture Approach	43
<ul style="list-style-type: none"> • Guiding Principles • Summary of Existing Capacity and Expertise • Recommended General Structure of the NC HIE 	
Appendix:	49
<ol style="list-style-type: none"> 1. Health IT Task Force Membership 2. Definitions of Commonly Used Terms and Abbreviations 3. “North Carolina: Picturing Health Information Technology” (Presentation by Tom Ricketts at the April 20, 2009 meeting of the HIT Task Force) 4. Selected Technical Architecture Models for a NC HIE 5. Summary of Recommended Action Steps 6. Synopsis of Public Comments 	

EXECUTIVE SUMMARY

The North Carolina Health Information Technology Strategic Planning Task Force (HIT Task Force) was established to forge a new vision of how health and healthcare can be improved by enhancing the use of health information technology. On behalf of the Governor, Dempsey Benton, Director of the Office of Economic Recovery & Investment, charged the Task Force to engage stakeholders to develop a set of strategic guidelines by which North Carolina could apply for, and most effectively use, resources made available through the American Recovery and Reinvestment Act (ARRA). The HIT Task Force was composed of 17 members however more than 65 subject matter experts, staff, and members of the public were invited to participate in the seven open meetings that were held from April thru June 2009.

The federal stimulus legislation known as the American Recovery and Reinvestment Act of 2009 (ARRA) contains authorization for approximately \$19 billion in funding for HIT infrastructure over six years. The largest portion, roughly \$17 billion, is set aside for incentive payments by Medicare and Medicaid to qualified providers for making meaningful use of electronic health records (EHR) in their practices. The remaining portion of ARRA funding, roughly \$2 billion, is appropriated to the Office of the National Coordinator (ONC). States have the opportunity to compete for a portion of the \$2 billion in the following ways: (1) Planning and implementation grants for health information exchange (HIE) development; (2) Loans for electronic health record (EHR) adoption available on a match basis of \$1 non-federal for every \$5 in federal funds; and (3) HIT extension programs for the establishment of Health Information Regional Extension Centers. A state must have an approved HIT strategic plan in place that is consistent with the National HIT Strategic Plan in order to apply for ARRA funds under the ONC portion.

The overall goal of ARRA federal stimulus funds for HIT is to create a nationwide health information infrastructure that enables electronic health information to be recorded, shared, and utilized in a way that improves health. Essentially this creates three broad goals: (1) the wide adoption and meaningful use of electronic health records (EHRs), (2) establishment of interoperable systems for health information exchange (HIE), and (3) aggregate data reporting to improve the quality of individual healthcare as well as overall population health. From the beginning, it was agreed that for HIT to be adopted widely, it must be affordable, provide value to the practitioner, be easy to implement and maintain over time and have the public's trust in the safety and security of the system.

The HIT Task Force envisions a future in which all residents of North Carolina are afforded ready access to and equal opportunity for accurate and secure health information wherever it is needed. Essential to the plan for interoperable health information technology is the creation of a NC Health Information Exchange (NC HIE) architecture that will securely connect consumers, providers and others, who have, or use, health-related data and services, while protecting the confidentiality of health information. Fortunately North Carolina has major academic medical centers, hospitals, physician practices, professional associations, non-profits and other entities that have already made significant investments of both time and money to help achieve this vision. By bringing these groups together to work collaboratively, the State is building upon its competitive advantages in the pursuit of these funds.

The HIT Task Force agreed on the following fundamental guiding principles:

- **The system must be consumer-centered.**
- **Better health, not just better healthcare, must be the goal.**
- **Appropriate privacy and security must be guaranteed.**
- **Strong ethical standards must be adhered to.**
- **Automating what we already do is not enough – we must work smarter.**
- **HIT investments must support improved individual health as well as population health.**
- **The system must be inclusive and comprehensive – encompassing all types of citizens and healthcare providers in all settings of care.**
- **The system must be collaborative to achieve coordinated and integrated care.**
- **Effectiveness and continuous quality improvement is fundamental.**
- **Innovation will be required.**
- **Sustainability is the key to long term success.**
- **This is a marathon not a sprint.**

The Task Force developed recommendations around the critical components of a successful HIT infrastructure and operations of a NC HIE:

Consumer Acceptance

Consumer acceptance and support is essential to success. The NC HIE must include the appropriate controls, access, and tools that enable all types of consumers to become engaged partners in their health and healthcare. This will require training and support for consumers and healthcare providers through the proposed Regional Extension Centers in North Carolina. Consumers must have a strong voice in the ongoing governance and operations of a NC HIE.

Privacy and Security

Confidence in the privacy and security of the NC HIE is critical to consumer acceptance. While the current HIPAA regulations provide a strong framework for privacy and security, NC would benefit from the formation of a public health law workgroup to consolidate and harmonize NC's medical privacy and security laws, as well as to standardize rules for data sharing between entities, and to allow for emergency release of health information under specific circumstances.

Healthcare Delivery

HIT is widely considered a necessary but not sufficient component of reshaping healthcare delivery in the US. The goal is to have the right information to deliver the best care in the right location whenever it is needed. NC can only achieve this success by building a robust HIT environment that utilizes state of the art technology, engages consumers, and involves healthcare providers across multiple disciplines and practice settings. NC must support all healthcare providers as they work to make meaningful use of EHRs no matter where they are currently on the broad continuum of effective utilization of HIT in their practices. Rapidly expanding the number of practices who use a certified HER system must be an early aggressive goal of this initiative.

NC has an ideal place to begin this transformation with **Community Care of North Carolina (CCNC)**. CCNC is the nationally recognized, enhanced medical home model for improving health and controlling costs for Medicaid patients by working through organized provider networks. CCNC and its partners already have care managers and quality consultants working with 3200 practitioners statewide who can readily support early adoption and meaningful use of EHRs as well as the initial sharing of information through a NC HIE. From there NC can build a platform for extending HIT to all 60,000 providers, practice settings, and payers.

Population Health

A successful NC HIE will provide tremendous opportunities to improve population health in NC. Observations and conclusions can be made by aggregating and analyzing selected health information from a defined population. A population can be as small as the number of diabetics in a single physician office or as large as all NC residents. Effective use of HIT and data reporting will enhance quality of care, disease management, public health surveillance and interventions as well as enable a broad range of biomedical research opportunities. NC is home to some of the nation's leading academic medical centers and research institutions. NC is also a recognized leader in utilizing information systems to improve state and local public health. The NC HIE must collaborate and build on these existing systems.

Financing and Sustainability

The cost of building and maintaining a robust interoperable HIT environment in NC is substantial in terms of time, manpower, and funding. Physicians and other healthcare providers will be required to re-engineer their business practices to install complex hardware and software in order to have the health information that can then be shared electronically. There is also significant expense to develop and maintain the technical infrastructure necessary to share the health information in a secure system. While the federal ARRA funds will be an important early contributor to these costs, additional funding, both private and state appropriated, will be necessary. The HIT Task Force identified significant state funding that can be used to match funds as required by ARRA. In addition, NC is fortunate to have a large number of private foundations and non-profit organizations that have invested in HIT in the past and are committed to support a NC HIE. The HIT Task Force also recommends that insurers reward healthcare providers who are early adopters of HIT through incentive payments. Other funding strategies discussed included user fees, new taxes, and per member per month payments to providers.

Governance and Operations

The HIT Task Force recommends the immediate establishment of an **North Carolina HIT Coordinating Committee** to serve as a single, high level, highly-visible entity to govern further HIT development for North Carolina and to guide the application for federal HIT stimulus funds. The HIT Coordinating Committee would provide the leadership and organizational structure necessary to move NC HIT forward as quickly as possible. The HIT Coordinating Committee, appointed by the Governor, would have a membership representative of the key stakeholders including physicians, hospitals, consumers, health plans, public health, academic medical centers, supporting health services and state government. The Task Force also recommends the establishment of a new position of State Coordinator of HIT.

The NC HIT Coordinating Committee should take advantage of the strong leadership and experience of existing agencies and organizations in NC to perform specific tasks related to the implementation of HIT strategies. The key operational areas include: (1) EHR adoption, (2) NC HIE design and implementation, (3) Quality reporting, and (4) Coordination of broadband connectivity capacity building. The report identifies suggested partners for key roles.

HIE Technical Architecture Approach

The Task Force recommended the creation of a NC Health Information Exchange Network (NC HIE) to provide a platform for sharing information. A state-level interoperable technology platform and governance entity, sitting between government and the healthcare sector with a mission to advance statewide HIE, provides distinct and valuable advantages that serve the public good. These advantages include:

- Ensuring that HIE develops beyond corporate silos to serve all statewide stakeholders and their data needs;
- Facilitating collaboration, rather than competition, related to data sharing to achieve the public good derived from mobilizing a full range of clinical and other information; and
- Serving public policy interests and addressing consumer protection concerns by facilitating widespread and effective data sharing practices for maintaining the confidentiality of health information.

The NC HIE would serve as a connection point for individual healthcare providers, community level HIEs, other state-level entities to the Nationwide Health Information Network (NHIN). There is a wide range of technical solutions that could be built to accomplish the information sharing objectives of the NC HIE. No single solution will fit every need. The NC HIE must allow a combination of systems, a “network of networks”, using identified national standards and innovative approaches that leverage existing HIT investments while at the same time establishing new requirements for interoperability and reporting.

Conclusion

North Carolina is in a strong position to garner significant federal funding for HIT advancement that will improve both healthcare delivery and quality and ultimately improve health for all North Carolinians. The HIT Task Force Report will assist the Governor and other state leaders as they quickly take the necessary steps to ensure the success of this initiative.

INTRODUCTION

Fifty years ago, visionary leaders from the public and private sectors sought to capitalize on North Carolina's unique assets and, through a concerted and collaborative effort of heretofore independent parties, the Research Triangle Park was created. The impact of such vision, leadership, collaboration and investment is evident in the growth of what is now one of the country's premiere research and biotechnology centers. It is with this same vision, ambition and sense of unprecedented potential that North Carolina stands ready to develop a model for the nation of an innovative and reproducible system for health information technology that will improve outcomes and quality of life for its citizens.

Governor Perdue recognizes that health information technology (HIT) is an essential element for reshaping and improving health and care for all North Carolinians. The NC Office of Economic Recovery and Investment established the HIT Strategic Planning Task Force to forge a new vision of health in which information technology systems are used as powerful tools to achieve outstanding quality in health care delivery, resource coordination, cost efficiency and patient safety. By moving these building blocks of care into an interoperable, patient-centered system that is not limited by isolation in location or time, best practices, optimal outcomes, and cost-efficient services will be supported and sustainable. Dempsey Benton, Director of the Office of Economic Recovery & Investment, charged the HIT Task Force to assemble a coherent plan by which North Carolina could apply for, and most effectively use, resources made available through the American Recovery and Reinvestment Act (ARRA). Despite broad diversity of interests and parties assembled, there was an over arching belief that North Carolina has unique infrastructure, collaborations and opportunities to use HIT to better develop and organize systems of care in which patients pursue health and in which healthcare is provided in a far more effective manner. The observations and recommendations contained in this report are important organizational, foundational, and developmental first steps in a journey to improve the health of all North Carolinians.

ABOUT THIS DOCUMENT

The purpose of this document is to provide initial recommendations for a robust HIT strategy that outlines the direction and vision that will optimize NC resources and potential. It is a set of strategic guidelines organized around critical components of a successful HIT improvement plan. Each section defines the guiding principles for a specific component, describes existing functionality in the state, and recommends appropriate actions steps. This report underwent multiple revisions in committee then incorporated significant public input before being finalized.

While this paper focuses on the NC HIE organization and architecture, it is important to acknowledge that successful statewide implementation of HIT will be dependent on a robust program for expanding the capacity and reach of broadband telecommunication services in NC. Efforts are underway to develop a comprehensive broadband deployment strategy in the state. This report assumes the appropriate connectivity is or will be available. Progress around broadband connectivity deployment and HIE development will be coordinated.

BACKGROUND

Health Information Technology (HIT)

Advances in information technology systems have dramatically altered the world in which we live. Huge investments, both public and private, make it virtually impossible to carry out the activities of daily living without utilizing some form of automation. For a variety of reasons, the healthcare delivery industry has been slow to take advantage of new technology on a broad scale. Only a small percentage of healthcare providers have successfully integrated information technology into their own practices. Even fewer have connected their systems with other providers in any meaningful way to improve care coordination and exchange of health information. Consequently, currently in North Carolina most medical records remain paper-based, and the vast majority of physicians provide ambulatory care in small practices with fewer than ten physicians. For HIT to be adopted widely, not only must it be affordable, provide value to the practitioner, be easy to implement and cost-effective to maintain over time, it must also engage the public's trust in the safety and security of the system.

American Recovery and Reinvestment Act of 2009

The large and complex federal stimulus legislation known as the American Recovery and Reinvestment Act of 2009 (ARRA) contains authorization for nearly \$19 billion in funding for health information technology (HIT) infrastructure over six years. The concepts for how this unprecedented investment in HIT is to be spent are set forth in the Health Information Technology for Economic and Clinical Health (HITECH) portion of ARRA. The overall goal of HITECH is to create a nationwide health information infrastructure that enables electronic health information to be recorded, shared and utilized in a way that improves health. Broadly described, this includes three major components: (1) the wide adoption of electronic health records (EHRs), (2) establishment of interoperable systems for health information exchange (HIE), and (3) aggregate data reporting to improve the quality of individual health care as well as overall population health. While HIT improvements alone cannot transform health care, the ARRA legislation and available funding are widely considered to be a “down payment on health reform.”

Of the total authorized funding, the largest portion, roughly \$17 billion, is set aside as incentive payments by the Medicare and Medicaid programs for providers who implement HIT in their practices. More specifically, to qualify for these incentive payments, the provider must adopt a certified electronic health record, demonstrate meaningful use of the EHR in their practice, and provide data for quality reporting. The complex payment formula for these incentives stipulates that eligible providers can begin receiving payments as early as 2011. In 2016 incentive payments come to an end, and providers who have not adopted meaningfully used HIT by that time will actually receive reduced payments for failure to comply.

The remaining portion of ARRA HIT funding, approximately \$2 billion, is appropriated to the Office of the National Coordinator of Health Information Technology (ONC). States have the opportunity to access a portion of the \$2 billion through: (1) planning and implementation grants for HIE development; (2) loans for EHR adoption available on a match basis of \$1 non-federal for every \$5 in federal funds; and (3) HIT extension programs for the establishment of Regional

Extension Centers. Federal funds may not provide more than 50% of the cost required to create and operate a Regional Extension Center.

A state must have an HIT strategic plan in place that is consistent with the National HIT Strategic Plan in order to apply for funds under the HITECH portion of ARRA. (Guidance on this competitive process is expected to be released in summer 2009.) Although North Carolina is recognized as a national leader in the development of HIT & HIE systems and policies, this comprehensive HIT strategic plan is needed to guide policy decisions and prioritize funding decisions.

HIT Strategic Planning Task Force

Charge: Develop a set of recommendations for utilizing Health Information Technology that will improve health and healthcare.

1. Create a shared state vision for HIT that will:
 - a. Assure privacy and security of health information;
 - b. Improve health care quality and coordination – behavioral and physical;
 - c. Improve health care safety;
 - d. Reduce health care costs or create efficiencies;
 - e. Assure the education of NC health professionals (current and future) to incorporate HIT into their practices;
 - f. Enable individuals, providers, and communities to make the best decisions for improving consumer and population health; and
 - g. Enable appropriate health services research.
2. Assess existing health information technology resources in the state both public and private. Identify HIT best practices.
3. Provide clear and concise direction on technical standards, governance models and possible financial incentives for sustainable HIT.
4. Review the federal ARRA legislation and recommend a strategy for securing all possible funds for HIT in North Carolina.

The State of North Carolina is very appreciative of the many stakeholders who openly shared information, debated issues and committed their time to help develop this report. Their efforts were supported by numerous subject matter experts and staff. (For a list of these participants, see Appendix 1.) Additionally, this plan benefited from the members of the public, advocates, providers, associations, vendors and others who observed the meetings and offered comments. A list of definitions for commonly used terms and abbreviations is also included in the Appendix.

SHARED VISION

The HIT Task Force envisions a future in which all residents of North Carolina are afforded ready access to and equal opportunity for accurate and secure health information wherever it is needed. Technology exists to design and build a fully integrated and connected health information system that will enhance efficiency, quality and effectiveness of the delivery of healthcare. Technology can also enhance the patient's ability to be an engaged consumer of healthcare and an important partner in their health management. Setting aside the issues of cost, there are significant overarching policy decisions and guiding principles upon which such a system must be founded. Each of the guiding principles below must be addressed and satisfied before HIT will be widely used and accepted.

- **The system must be consumer-centered.** *A critical element toward improving health is an engaged consumer who has the means, information, opportunity and the know how to better manage their own health and lifestyle choices. Engaged consumers will have easier access to and more control over their individual health records and they will be able to play a more active role in managing their own health. Sharing information between multiple providers and across disciplines will improve the decisions providers make and result in better continuity of care.*
- **Better health, not just better healthcare, must be the goal.** *Better health requires looking beyond just HIT and the traditional practices of healthcare providers and payers to create a virtual "health home" where care is coordinated and collaborative. Prevention is the key. It must be a shared commitment of public and private employers, non-governmental organizations, communities and individuals.*
- **Appropriate privacy and security must be guaranteed.** *Individual personal health information must be protected. Consumers will accept sharing sensitive personal information if it is done on their behalf to assure that the right information is shared at the right time and for the right reasons. At times this means immediate and secure access to certain critical information from any location in the system.*
- **Adherence to strong ethical standards.** *The full trust and support of stakeholders will be enhanced by adherence to strong ethical standards, conflict of interest, and full disclosure in all business operations involving HIT.*
- **Automating what we already do will not work.** *We cannot expect to get better health outcomes by simply applying information technology on top of the existing system of inefficiencies, silos and uncoordinated care. A reengineered HIT system seeks to eliminate the costs associated with redundant care or care not supported by clinical/scientific evidence.*
- **HIT investments must support improved individual health as well as population health.** *Use the federal stimulus funds to drive the changes needed in the overall system that will create sustainable and continuous quality health improvements. The new HIT*

system and policies should leverage existing investments in technology, take advantage of innovations, and identify opportunities for new investments.

- **The system must be inclusive and comprehensive.** *The system must be standards-based. Whether physical or behavioral health, long term or acute care, public or private provider, insured or uninsured, veteran or civilian, rural or metropolitan, all can be part of the system. The HIT system is provider and insurer-neutral. Its design and implementation does not favor or disadvantage any provider type, practice setting, or insurer.*
- **The system must be collaborative.** *No single entity can accomplish the HIT vision alone. Working together, North Carolina's hospitals, physicians, therapists, laboratories, pharmacists, in-home care providers, educational institutions, public agencies and non-profit organizations will improve the health of residents and communities. Collaboration among communities will enhance North Carolina's response to public health threats, disasters, and state and national emergencies.*
- **Effectiveness and continuous quality improvement is fundamental.** *The ability to analyze and share data across entities will reduce duplication of services, identify best practices, better utilize resources, reduce health disparities, lead to better practice management, and inform future policy and planning decisions and expenditures.*
- **Innovation will be required.** *Ongoing research and analysis of changing needs and technologies will keep the system dynamic and timely. Implementation and continuous improvement strategies will require an iterative approach that maximizes resources and follows national standards and certification requirements.*
- **Sustainability is the key.** *The system will be sustained by a network of supports to provide technical and professional education, training and consultation. The long term stability of HIT will be built upon financial incentives and value-added functionality rather than a mandate to participate.*
- **This is a marathon not a sprint.** *HIT systems will be built incrementally. Every stakeholder in the process must be able to move ahead from where they are on the continuum from minimum HIT involvement to fully electronic and interoperable networks. This means that the implementation process will accommodate a broad range of participants including the small independent community practitioner as s/he decides to implement an EHR in the practice, as well as a large hospital health system with an existing sophisticated HIT system.*

UNIQUE NORTH CAROLINA LEADERSHIP AND PARTNERSHIPS

North Carolina can make a difference. *North Carolina is uniquely positioned to evolve a model of HEALTH that can more effectively serve the nation. The critical elements for success already exist: a culture of collaboration and innovation, pilots and programs that work, significant existing IT investments and infrastructure, thought leaders in our academic medical centers, a robust biomedical research community, private funding partners with a track record of investing in HIT, large military bases and VA medical centers, Eastern Band of the Cherokee Indians, strong underpinning of safety net providers, and strong core public health programs at the state and local level. The HIT Task Force recognizes that the resources available through ARRA represent not only an unprecedented opportunity to help forge these unique elements into a truly cooperative and aligned system of care, but also are on a scale that can stimulate the state to enable NC to reach the needed “collaborative tipping point”.*

A partial list of key NC leadership and organizations:

- **Academic Medical Centers:** Duke University Health System, University Health Systems of East Carolina, University of North Carolina Health System, Wake Forest University Health Sciences
- **Area Health Education Centers of North Carolina**
- **Carolinas Center for Medical Excellence**
- **Community Care of North Carolina**
- **Hospital Systems:** Carolinas Healthcare System, Mission Health Systems, Moses H. Cone Memorial Hospital, and Wake Med Health and Hospitals
- **Mental Health Association of North Carolina**
- **North Carolina Medical Society**
- **North Carolina Hospital Association**
- **North Carolina Association of Local Health Directors**
- **North Carolina Health Quality Alliance**
- **North Carolina Center for Public Health Quality**
- **North Carolina Center for Hospital Quality and Patient Safety**
- **North Carolina Healthcare Information and Communications Alliance**
- **North Carolina Department of Health and Human Resources:** Division of Public Health; Division of Medical Assistance (Medicaid); Division of Mental Health, Developmental Disabilities, and Substance Abuse Services; Division of Rural Health and Community Care; Office of the Secretary
- **Private Foundations:** Blue Cross and Blue Shield of North Carolina Foundation, The Duke Endowment, the Golden LEAF Foundation, Health and Wellness Trust Fund of North Carolina, Kate B. Reynolds Charitable Trust
- **University of North Carolina Gillings School of Global Public Health**

CONSUMER ACCEPTANCE

Consumer acceptance and support is essential for the enhanced use of HIT in healthcare delivery and health management. The term consumer and not patient is deliberate. The shared vision for HIT in NC involves more than just the traditional doctor-patient relationship. Health involves a complex interaction between patients, family members, care providers, support systems and service providers. This has always been true, but technology can enable any and all players to communicate and interact in new and faster ways. Done correctly, technology is a powerful tool. Done inappropriately, it becomes part of the problem.

Guiding Principles

- **The consumer is the center of the system.** A central purpose of the NC Health Information Exchange (NC HIE) is to empower consumers to be more active in managing their health by making more informed decisions about their healthcare and improving communication with and among their health professional partners. Individuals will make decisions about the use of their personal health record (PH) and determine with whom that information will be shared.
- **Everyone is a consumer.** Every resident of the State of North Carolina will become a consumer and/or beneficiary of the NC HIE and have a vested interest in the success of the system. Everyone in the healthcare provider community—whether providing direct medical or behavioral care, pharmacy, and laboratory or imaging services—will benefit from being able to submit information to and verify an individual’s information via the NC HIE. Whether the patient is seen in the emergency room, a provider’s office, an acute-care hospital, a long-term care center or a correctional facility, their clinical information should be available in real time to assure that good decision support is available at the point of care.
- **Confidence in the security of the system is essential.** Individual consumers must be assured that the privacy and security of their electronic health information will be strictly protected in accordance with state and federal laws. Providers need to know that they can readily access clear, complete and up-to-date records at the time of delivery of service. All consumers must be assured that any violation of security requirements or breaches of the system will be immediately investigated and appropriate consequences and penalties will be applied.
- **Consumers need tools and training.** IT systems are only as good as the information in them. Consumers at all levels will need training and appropriate access for their level of security, and training must be provided through multiple media and face to face options. Training must be on-going, culturally and literacy-level appropriate, and cross-generational.
- **A governance structure in which consumers have confidence needs to be established.** A broad-based governance structure will provide leadership, IT expertise, policy guidance and maintain the critical balance between individual rights and the greater public benefit. All levels of consumers should be represented in the governance structure.
- **Perceived value will determine consumer support and participation.** Many consumers are aware of the growing use of electronic data management in the healthcare field, but the majority is not. Consumers need to be made aware of the potential of NC HIE to enhance the provider-consumer relationship by enabling more frequent, customized and informed dialogue. Value will be achieved through a transparent and auditable system that generates

consistent quality and performance results and that helps eliminate disparity in the delivery of services.

Summary of Existing Capacity and NC Expertise

North Carolina is fortunate to have existing expertise in health information technology. The Task Force benefited greatly from the participation of: the North Carolina Healthcare Information and Communications Alliance, Inc. (NCHICA), the Western North Carolina Health Network's Data Link, the University Health Systems of Eastern Carolina's HealthSpan, individual medical practices, Duke Health System, UNC Healthcare, and WakeMed Health and Hospitals.

North Carolina also has an expansive network of entities available to assist in efforts to inform, instruct and train users of the NC HIE. The State has a long history of regional education and outreach through its Agricultural Extension Program and the NC System of Community Colleges and their adult educational programs. Additional organizations which can participate in HIT education include: the 8 Area Health Education Centers, the 58 campuses of the Department of Community Colleges, the Senior Centers available in all 100 counties, the 14 Community Care of North Carolina regions, Area Aging Councils, the Senior Health Insurance Program (SHIP), Health Insurance Information Program and its volunteer network, as well as the North Carolina Association of Free Clinics. Other governmental agencies, quasi-governmental entities, educational institutions, and private and non-profit organizations will be asked to share information with the people they serve.

NC has comprehensive medical quality programs, which can facilitate HIT-related improvements in quality of medical treatment, better patient outcomes and financial efficiencies. The North Carolina Healthcare Quality Alliance and the Carolinas Center for Medical Excellence have actively participated in the Task Force and will play an integral role in the future utilization and management of the system. Finally, North Carolina is fortunate to have a Governor with extensive experience in healthcare education. She is uniquely positioned to assure that future health education in NC's public schools will include access and use of HIT to improve individual and public health.

Recommended Action Steps

- 1. Assure substantive participation of consumers or consumer groups in the Governance Structure.**
- 2. Assure that the NC HIE includes plans for appropriate access and tools for all types of consumers.**
- 3. Charge the proposed North Carolina Regional Extension Centers to provide training and support for consumers of healthcare to better utilize HIE.**
- 4. Create a committee to develop a specific plan, including the estimated cost and timeline, of a multi-pronged and multi-media outreach and training effort directed to consumers.**

5. **Assure that HIT training for healthcare providers includes training on how to actively involve consumers in the use of HIT to encourage them to participate fully in decision making about their healthcare. Part of this task is to identify ongoing education and training needs of the future healthcare workforce.**

PRIVACY AND SECURITY

A public that is confident and comfortable with the privacy and security of sensitive personal health information is the cornerstone of a successful HIT system. This system must capture the important elements of the patient's electronic health record (EHR), involve that patient in his or her care through his or her own personal health record (PHR) and share the essential elements that ensure optimal care and patient safety between providers on a timely basis using a robust electronic health information exchange (HIE). This supple flow of health information will require a major educational program for our citizens concerning privacy standards and best practice. It is also likely that as the technology improves these standards will evolve. To provide North Carolinians and their caregivers the benefits of HIT and minimize the risks, we must guarantee certain core privacy principles.

Guiding Principles

- **The system must be transparent.** Individuals must clearly understand how their information will be used.
- **Accurate, complete and current health information is essential to improving the quality of healthcare delivery and results.**
- **Individuals must have appropriate access rights to see their records and amend them as appropriate to ensure accuracy, completeness, and timeliness.**
- **There should be a clear statement of the purposes and uses of information collected and used.**
- **Only necessary information shall be collected and shared.**
- **Consent release procedures shall be developed and followed for the use of information that goes beyond specified purposes.**
- **Technical and administrative safeguards shall be built into the system.**
- **Accountability and enforcement of compliance with security processes are essential to maintain confidence and widest possible use of HIT.**

Summary of Existing Capacity and NC Expertise

Current North Carolina privacy and security laws are scattered throughout the General Statutes and the North Carolina Administrative Code. There are some variations in when and under what circumstances personally identifying health information (PHI) may be exchanged, depending on the type of information, the intended recipient of the information and the purpose of the disclosure. North Carolina law generally does not provide a cohesive framework for the privacy and security of health information that is exchanged electronically, though the major provisions of law apply to information in either electronic or non-electronic formats.

Other states have either re-codified their laws regarding release of health information so that those laws are in a single section of the applicable code, or they have enacted new laws specifically addressing the privacy and security of health information in the context of electronic exchange of that information. These states have recognized that the law will have to adapt to the 21st century paradigm of information sharing, which involves release not from one party to one other party but from one party or data point to many others on a real time basis and even to data points outside of state borders. This new paradigm will require additional, more focused

consideration of the manner in which to maintain appropriate privacy and security protections over those exchanges.

Good privacy regulations should not discourage use of health information technology. Specific actions to streamline and clarify state privacy laws may actually encourage EHR adoption (see <http://www.ama-assn.org/amednews/2009/05/04/gvsc0504.htm>). Also, a sound legal framework for health information privacy and security provides protection for consumers whose information is exchanged electronically while permitting providers and population health services to benefit from electronic HIE.

North Carolina is fortunate to have a technical and informational resource that has been working to identify gaps and improve adherence to the needs for privacy in information exchange. North Carolina Healthcare Information and Communication Alliance, Inc. (NCHICA) was designated by the Governor's Office as North Carolina's representative to participate in the 44 state Health Information Security and Privacy Collaboration (HISPC) and the Architectural Prototypes and Trial Implementations projects for the Nationwide Health Information Network funded by the Office of the National Coordinator (ONC) for the past five years. NCHICA formed the NC Consumer Advisory Council on Health Information in 2006 to provide advice and guidance with respect to the use of electronic health information and exchange of records electronically. More information about the HISPC project is available at <http://www.nchica.org>.

Additionally, beyond North Carolina, there are groups that have presented various aids for security risk management in HIE. The Markle Foundation, HIMSS Privacy and Security Toolkit, eHealth Initiative, and the Office of the National Coordinator for Health Information Technology offer support.

Recommended Action Steps

- 1. Form public health law workgroup to propose changes to consolidate and harmonize North Carolina's medical privacy and security statutes, with particular attention to statutes that affect electronic health information exchange.**
- 2. Educate health care providers, employers and consumers about privacy and security of information.**
- 3. Enact safe harbor(s) for release of, or access to, health information under certain limited circumstances (e.g., emergency treatment).**
- 4. Enact state law to expand, in a responsible manner, the list of persons and entities to which a clinical laboratory may release test results, beyond the ordering provider.**
- 5. Utilize standard agreements for governing data sharing between entities**
- 6. Explore electronic consent directives and interstate compacts addressing consent to release information and/or consistent privacy and security standards for electronic health information exchange between states.**

7. **Utilize standards-based approaches to ensuring North Carolina stakeholders, including consumers, have adequately addressed the four “A’s” of Security (Authentication, Authorization, Administration and Audit) as privacy and security solutions are implemented.**

HEALTHCARE DELIVERY

North Carolina can only achieve success in building a robust HIT environment that uses state of the art technology to engage consumers, expand information sharing, and inform clinical decision-making when all providers, across multiple disciplines and from all practice settings, become meaningful users of EHRs. Full participation of individual practitioners is essential to realizing the great potential HIT brings to health.

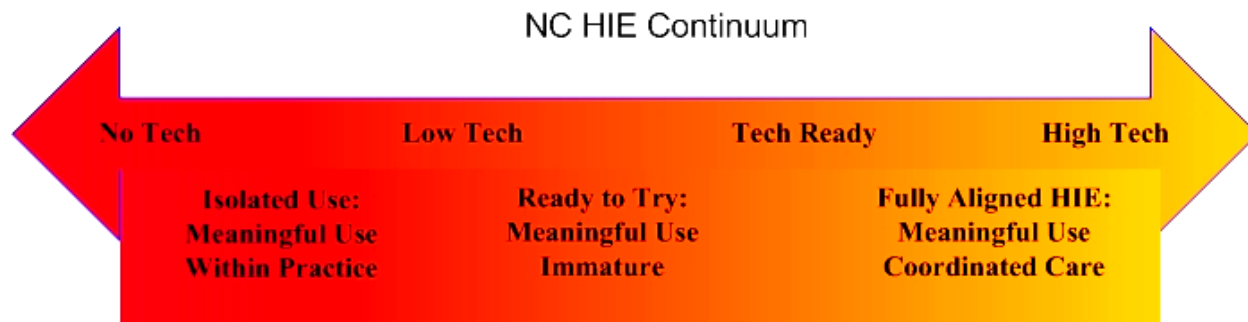
HIT is a necessary but not sufficient component of reshaping healthcare delivery in NC. The biggest return on investment in HIT will come when clinical decision-making and care coordination can occur rapidly and seamlessly between care providers. The technology exists to readily allow such exchanges of information. The bigger issue is encouraging care providers to change how they practice medicine in light of the ability to better coordinate care because of the new technologies. This will require significant education for providers and consumers, training of users, and ongoing system support.

Guiding Principles

- **HIT capacity is based on a commitment to delivering the right care, at the right time and in the right setting.**
- **All providers must have access to HIT.** Incentives, grants and loans will be essential to allow providers to participate.
- **Providers must see value in adopting EMRs and participate in HIEs.** Value will come in the form of incentives, improved outcomes, or provider satisfaction. Participation should not be mandatory or exclusive.
- **Every provider must understand the steps necessary to move forward with HIT regardless of where they are in the continuum of automation in their practice.**
- **HIT that is realistically based on the normal provider workflow will be better accepted by the provider community.**
- **To facilitate interoperability providers must use a certified EMR, but they must have a choice when selecting the particular vendor software and hardware.**
- **Providers must make meaningful use of the EMR to qualify for the Medicaid and/or Medicare incentive payments.** Although the term “meaningful use” will be further defined by federal rules, our current assumption is that the definition means that the provider exchanges health information, performs electronic prescribing and participates in quality reporting.
- **Patient information should not be controlled for the competitive advantage of any provider.** Universal access to patient information through EMRs and other methods of information exchange should be open to all appropriate providers involved in the care of the patient.

Summary of Existing Capacity and NC Expertise

There is no definitive data to indicate how many providers in NC currently utilize electronic systems for clinical operations. While most provider offices have computers, there is a wide range in how they are being used. A rough estimate of the number of NC practices utilizing some form of EMR for clinical care is 20-30% however an estimate of practices which fully utilize an integrated EMR is only 6-8%.



EMR Adoption

Providers have three basic methods for adopting an EMR in their practice: (1) Purchase a system for their own use, (2) Use an EMR provider service, or (3) Affiliate with a partner health system that has a shared EMR system. All of these options are open to providers in NC but vary region by region.

EMR systems are either certified or not. Certification is an evolving process. Currently the Certification Commission for Healthcare Information Technology (CCHIT) is the certifying body recognized by the U.S. Department of Health and Human Services (HHS). CCHIT is a Chicago-based independent organization that operates much like the Joint Commission for Accreditation. CCHIT publishes criteria for an EMR to qualify for certification and conducts inspections to determine if the EMR meets the standard to be called “certified”. The ARRA calls for use of “certified” electronic records for providers to be eligible for the incentive payments under Medicare and Medicaid, however the Secretary of HHS and the ONC have not officially determined whether they will use the CCHIT standards in the future. CCHIT recently announced an updated version of their certification criteria and a companion guide to meeting the ARRA requirements.

Meaningful Use

Perhaps one of the most important new concepts introduced in the ARRA is “Meaningful Use”. The definition of the meaningful use (MU) of EMRs will determine the provider’s ability to qualify for the Medicare and Medicaid incentive payments. The National Committee on Vital and Health Statistics (NCVHS) serves as the statutory public advisory body to the Secretary of the US Department and Health and Human Services and, by extension, the Office of the National Coordinator. NCVHS conducted public hearings on the variety of definitions of MU and will release a report of their recommendation in June 2009. (Note: The current Chair of NCVHS is Harry Reynolds, Vice President of Blue Cross and Blue Shield of NC and a member of the NC HIT Task Force.)

The Healthcare Information and Management Systems Society (HIMSS) has published two definitions of "meaningful use" as it applies to the use of certified electronic health record technologies in hospital settings. According to HIMSS officials, EHR technology is

"meaningful" when it has capabilities including e-prescribing, exchanging electronic health information to improve the quality of care, having the capacity to provide clinical decision support to practitioner order entry and submittal of clinical quality measures, and other measures, as selected by the Secretary of Health and Human Services. Officials say physicians must meet the definition within a specified time frame, as described in ARRA.

In order for hospitals to have a reasonable chance of achieving the definition, HIMSS officials say the requirements must be introduced in incremental stages. In order for hospitals to meet each stage, milestones must be achieved in phases of not less than two years each, commencing in FY11. In the final phase, which must commence in 2015, HIMSS officials believe the mature definition of "meaningful use of certified EHR technology" will include at least four attributes:

- (1) A functional EHR certified by the Certification Commission for Healthcare Information Technology (CCHIT);
- (2) Electronic exchange of standardized patient data with clinical and administrative stakeholders using the Healthcare Information Technology Standards Panel's (HITSP) interoperability specifications and Integrating the Healthcare Enterprise's (IHE) frameworks;
- (3) Clinical decision support providing clinicians with clinical knowledge and intelligently-filtered patient information to enhance patient care; and
- (4) Capabilities to support process and care measurement that drive improvements in patient safety, quality outcomes and cost reductions.

HIMSS officials have urged that CCHIT be named as the certifying body for EHR technology.

Education

Regardless of where providers find themselves on the continuum of automation utilization, it is clear that ongoing education of current and future healthcare providers is a critical success factor for reaching the goal of fully aligned HIT and coordinated care. Knowledge of information technology and communications is fast becoming a skill that all healthcare providers must have on some level. The ARRA legislation recognizes the importance of provider education through a variety of proposed programs. Grants will be provided through a number of programs funded through several mechanisms and agencies to address multiple educational needs. At the time of this report, the timing, size and qualifications needed to apply for these program funds are not clear, but several types of training will be needed and are envisioned by ARRA:

- Health Information Technology Regional Extension Centers (RECs). The request for applications is expected in August or September of 2009. These RECs (number unknown at present) will work with providers on issues of choice of IT system for a hospital or practice, as well as implementation of systems so as to gain maximum usability in improving quality and efficiency of care. North Carolina's AHEC system, community colleges and several not-for-profit organizations that currently work with providers around IT and quality of care issues (Community Care of NC, the state medical society, Carolinas Center for Medical Excellence, NC Health Care Quality Alliance, etc.) make NC an attractive site for such a REC. Early discussions regarding the organization of the application have taken place.

- Education in medical and other health schools. Core competencies in health information technology will need to be incorporated into curricula in medical school and residency education, nursing, public health, pharmacy, and allied health. Federal funds will be available to partially support these activities.
- Certificate and Master's programs in health informatics will be needed. Although local matching funds will be required, federal funds will be available to support the initiation and expansion of certificate and graduate programs. NC currently has at least three such programs in existence or planned, and discussions have occurred with regard to UNC General Administration coordinating a response to the challenge and opportunity posed by the rapid expansion of health care IT. NC, like most states, currently does not have enough faculty and content experts in this area, and a training process should begin immediately. Distance education will be an important part of the program, so that expertise will be available to providers throughout the state. Additionally, the community college system has been involved in these discussions since nursing and allied health training already in practice will be part of the program.

Community Care of NC as a Starting Point

There are over 60,000 providers of health care and related services in North Carolina. The long term vision is to have almost all providers in North Carolina connected and able to electronically exchange all needed medical information. Choosing what information should be electronically exchanged first and which providers should be targeted for earliest adoption are critical to achieving the necessary return on investment (ROI) in the form of improvements in care quality, cost and effectiveness. The right ROI will produce the needed tipping point for the larger transformation of health care delivery in NC. The Office of the National Coordinator (ONC) has been clear that Medicaid and Medicare providers should receive priority in EHR implementation assistance. (NOTE: The prioritization of the health information to be collected and transmitted electronically is dealt with elsewhere in this document.)

North Carolina has benefitted from several pioneering efforts in HIT involving the investment of millions of dollars in HIT, EMR, and PHR by several of its larger hospitals, its Academic Medical Centers, a coalition of smaller hospitals and health systems, and progressive individual practices. North Carolina institutions have substantial commitments already underway in the areas of telehealth, e-prescribing and electronic lab reporting. As NC seeks a more integrated system, incorporating past efforts and aggressively building new capacity will be critical. North Carolina's unique care coordination network, Community Care of North Carolina (CCNC) is a logical place to begin integrating existing systems of care with its own significant infrastructure currently providing care to underserved populations.

CCNC is a well respected and successfully implemented patient-centered enhanced medical home model for improving care and controlling costs. The CCNC is a network of 14 healthcare communities that is already working statewide. It is organized and operated by community physicians as well as local hospitals, health departments, academic medical centers, and departments of social services. After 10 years of concerted efforts in development and implementation, CCNC includes 3200 physician participants and covers more than 800,000

Medicaid beneficiaries (many who are dual eligibles for aged, blind and disabled). The specific objectives of CCNC are:

- To improve the care of the Medicaid population while controlling costs;
- To develop community networks capable of managing recipient care;
- Fully develop the Enhanced Medical Home Model; and
- To develop the systems needed to improve chronic illness.

The enrolled Medicaid population has access to their own primary care physician. CCNC is designed to provide continuous, comprehensive care to patients and to maintain effective communication between all providers involved in the care process.

Evidence of significant success from the CCNC's initiatives was reported in a recent actuarial study from Mercer Human Resource Consulting Group.²⁶ This study found, when comparing what the Access model (case management model replaced by CCNC in 1998) would have cost in SFY06 without dedicated efforts to control costs, the program saved approximately \$154 - \$175 million while annual costs for the program were \$10.2 million. The CCNC network realized this success even though it utilizes primarily manual processes and paper medical records.

To achieve the program objectives of access, quality, utilization, and cost CCNC focuses on program wide quality improvement and care management initiatives such as:

- Medication/pharmacy management;
- Emergency department utilization;
- Chronic disease management—asthma, diabetes and heart failure;
- Case Management of High Cost / High Risk Patients.

Based on population needs some networks also have other quality initiative pilots such as: Assuring Better Child Development, Chronic Obstructive Pulmonary Disease, Improving Pediatric Access through Collaborative Care Early, Diabetes Disparities, Co-Location and Mental Health Integration. The success of the CCNC model has been documented in studies conducted by both the Cecil G. Sheps Center for Health Services Research at the University of North Carolina (UNC) and the Mercer Human Resources Consulting Group, detailing savings from its asthma, diabetes, and pharmacy management programs of \$3.5 million, \$2.1 million, and \$1 million, respectively. Given the vulnerable population that CCNC serves and its statewide breadth and infrastructure, coupling EMR adoption and HIE development with the current efforts of healthcare has the potential to further improve cost efficiency and health outcomes.

(Adapted from Quality Measures and Initiatives in North Carolina, The North Carolina Healthcare Information and Communications Alliance, Inc., May 2009)

Broadband Internet Connectivity

It is important for the successful implementation of a NC HIE to be coordinated with the efforts underway to expand broadband connectivity. All locations participating in healthcare information services must have access to high-speed, reliable telecommunications services. The NC HIE will ultimately involve the timely exchange of consumer data including X-ray images, MRIs and CT scans which will require robust internet capabilities.

Efforts are underway to develop a comprehensive broadband deployment strategy in NC through another ARRA program (NTIA ARRA/BTOP). The strategy will emphasize the need to enhance the “middle mile” capacity to community anchor institutions such as hospitals, health clinics, and other healthcare providers. It will also expand access to consumer residences and small business locations by coordinating with the e-NC authority and the commercial telecommunications service providers. The Microelectronic Center of North Carolina (MCNC), operator of the North Carolina Research and Education Network, (NCREN), is actively seeking to establish public-private partnerships to create new fiber-optic routes and make additional capacity available to community anchor insitutions.

The services needed to fully connect CCNC practices include:

1. Identification of areas where broadband internet connectivity infrastructure is inadequate or unavailable to CCNC practices with significant Medicaid, Medicare, SCHIP enrollment and prioritize to secure.
2. Survey of current level of IT use by each CCNC caregiver, inclusive of lab, medication prescribing, registry use, care/case management, and patient education, communication and self management.
3. Prioritize CCNC networks, CCNC practices and participating CCNC care management providers, for EMR loan programs and other capital investments related to HIT installation and connectivity.
4. Identification and/or development of an HIE mechanism for CCNC and unaffiliated practices. It is fully expected that such an HIE will evolve to provide a wider array of IT support (such as decision support, registry maintenance, performance monitoring) as the application and use of HIT widens. It will also provide connections to the large health systems and health consultants involved in a patient’s care.
5. Engagement of practice consultants and technical experts to assist CCNC networks and individual practices in the assessment of office IT needs, and IT development and implementation plans.
6. Provide targeted assistance and financial support to assist practices during the difficult adoption period when provide productivity typically suffers.
7. Make resources available to support the development of successful adoption, implementation, and transition strategies from CCNC pilot phase to other NC practices.

Subsequent efforts would include developing connectivity and patient information exchanges with behavioral health providers with particular emphasis on assuring appropriate transition of mental health patients from institutional settings to community providers.

Recommended Action Steps

- 1. Develop an implementation plan for NC that provides a mechanism for all providers to build capacity for HIT.**
 - This should include steps to ensure lower cost alternatives to “traditional” vendor supplied EMR software, including the use of open-source alternatives when appropriate.
 - The implementation plan should allow for the need of a large number of state providers to increase HIT capacity in a rapid fashion; i.e. less than 2 years.

- 2. Establish a core capacity for EMR data collection and HIE.**

Potential core capability:

 - Internet access with broadband capability
 - Primary clinical problem list
 - e-Prescribing
 - Laboratory results
 - Radiology results and images
 - Protocols for quality measure reporting
 - Standard information exchange capabilities to send/receive from other health entities and PHRs
 - Support for near real time clinical decision making
 - Interfaces to NC HIE for population health and secure registries on individuals.

- 3. Use CCNC as the starting point for implementation of the NC HIE with the understanding that lessons learned would be used to expand the program to all providers, patients and payers.**

- 4. Facilitate a consortium of NC educational institutions/organizations to establish a Regional Extension Center to assure current and future providers are appropriately trained to optimize their use of HIT.**

- 5. Assure a continuous flow of public health information from EHRs to the “designated entities” collecting such data, automatically and in standard formats.**

- 6. Develop the measurable quality of care criteria for patient safety and health.**

- 7. Develop the accountability standards that will measure the implementation and effective use of HIT.**

- 8. Continually monitor the meaningful use and certification criteria as updated by CMS/Medicaid so that:**
 - NC health professionals continue to understand and implement the necessary EHR capabilities to receive incentive payments
 - NC health professionals can insure that their EHR systems remain certified against national standards.

POPULATION HEALTH

In the context of HIT, population health is the use of electronic information to improve the health of a population. A population may be as broadly defined as residents of NC or as narrowly defined as pregnant women in an individual physician practice. The fundamental premise is that by aggregating and analyzing selected information on a specific population there are important observations that can be made that lead to improvements and/or efficiencies.

Guiding Principles

- **All providers must report the required minimum data set to the NC HIE.** Under existing state law, certain specific health data is already being reported to the state primarily for the purposes of public health and communicable disease control. Additionally, a new minimum data set is expected to be established that identifies the required elements for the NC HIE and must be shared if the patient does not opt out of the NC HIE. All providers may choose how they connect to the NC HIE. Most providers are expected to choose to be a part of a community HIEs in their area. Some may choose to connect to a national platform through a system outside of NC. Regardless of where the provider connects, certain data elements must be made available to the NC HIE under specific circumstances.
- **NC HIE must serve the public good.** The operational model envisioned for the NC HIE is similar to a public utility model where decisions are made in an open and transparent process to serve the common good (as in public or population health) as well as improve the health of individuals.
- **Data must be made available for biomedical research purposes.** Research and development are critical elements of an evidenced-based system of quality improvement. Any research requiring access to personal health information must be approved by an appropriate Institutional Review Board and follow accepted best practices of confidentiality and data quality.

Expected uses for population health:

- 1) Disease Management;
- 2) Public Health Surveillance;
- 3) Evaluation and Prioritization of Public Health Interventions
- 4) Disaster Management and Situational Awareness During a Public Health Emergency;
- 5) Comparative Effectiveness Research; and
- 6) Health Services Utilization Analysis.

Role of Research

The primary focus on the current national initiative in HIE is to establish interoperable electronic health records (EHRs) in providers' offices and information exchange with other care providers. Using this information for population health purposes enhances disease management of populations (within the practice, the community or state), disease surveillance and reporting and biomedical research. Historically, the collection of data from paper records has been slow, expensive and labor intensive, frequently involving travel between medical offices to retrieve charts, as well as the expense of paying research assistants to abstract the data, and subsequently to enter the data into electronic format for analysis. Even though it is widely recognized that claims payment data do not accurately reflect services delivered, for years researchers have had

to utilize them as a surrogate for care delivered in outcomes research studies. HIT systems now permit utilization of EHR data to examine care patterns and outcomes across a wide variety of care settings, increasing the wider applicability of the research, thus reducing cost and providing answers to research questions more quickly. The Veterans Administration (VA) has conducted successful research through its EHR for several years; however, its broader applicability has been limited by the fact that their patient population is often elderly and overwhelmingly male.

In order for research using EHRs to be successful, data across practices and from differing vendors must be transferred using common standards, data definitions must be transparent and documented, and coding must be consistent across vendor systems. While EHR data can enhance many types of research, it is particularly helpful in the following circumstances:

- **Research on quality of care improvement.** Improving care quality through enhanced documentation, reliable e-prescribing and use of evidence-based registries, prompts, and reminders is not just research—it is the essence of clinical care. Determining which quality of care interventions work best is currently impeded by the necessity of abstracting hundreds or thousands of medical records in order to arrive at conclusions. Interoperable EHRs will greatly speed knowledge growth in this important area. Users of this research will include clinical practices, payers such as Blue Cross Blue Shield of NC (BCBS) and the Division of Medical Assistance (DMA), and quality improvement organizations such as Community Care of North Carolina (CCNC). (Note that both DMA and CCNC are part of the NC Department of Health and Human Services (DHHS)).
- **Linked databases.** Individuals may enroll in a research study in a number of ways: by filling out surveys, donating tissue, or giving blood samples for DNA studies. Linking research data, with appropriate contents, with clinical data such as laboratory information, medication use or radiology studies can be quite powerful. Linking research and clinical information can save time, increase the number of subjects who can be studied, and increase data accuracy. Medication information and genetic information can, when linked, provide insights into ways to truly personalize medicine. Currently, industries sometimes outsource clinical trials overseas for cost reasons, thus depriving US patients of opportunities to participate in care innovation. Clinical trials of drugs and devices must become quicker and less expensive in order to better benefit the public health of the US.
- **Pharmacoepidemiology.** The discipline of pharmacoepidemiology examines the patterns of use of drugs and devices in the population, with a special emphasis on identifying the occurrence of harms and drug interactions. NC HIE would greatly benefit this discipline by providing the ability to examine relationships between medication use and laboratory data, as well as by providing detailed clinical information of patient risk factors and co-morbidity. Currently, much of the research using EHRs is conducted using either VA data or British EHR information.
- **Comparative Effectiveness Research (CER).** Providers currently have multiple options available for the treatment of many diseases, yet information is limited as to which

treatment is most appropriate for a given individual. Combining CER with electronic health record data can greatly help the provider at the site of care improve care quality. Currently, the federal agency funding CER, the Agency for Healthcare Research and Quality (AHRQ), collaborates closely with UNC-Chapel Hill, Research Triangle Institute and Duke University through a number of grants and contracts. These include evidence-based practice centers conducting systematic reviews of the literature as well as pharmacoepidemiology research programs. ARRA separately designated \$1.1 billion for CER. NC has significant capabilities and experience on which to base collaborations that would make NC very competitive for these funds.

- **Translational Research and Dissemination.** Delays in adopting new discoveries into medical practice are not uncommon. Important examples include decade long delays in the widespread use of angiotensin converting enzyme inhibitors in congestive heart failure and beta-blockers after heart attacks (acute myocardial infarctions). While clinical decision support tools assure exposure to new discoveries and best practices, they do not guarantee rapid onset of their use. The NCHIN can be utilized to measure the effectiveness of both EMR-based, healthcare, and public health practice level interventions to rapidly spread new discoveries that improve patient outcomes including survival and quality of life.

Summary of Existing Capacity and NC Expertise

Existing Research Capacity

North Carolina has a major research infrastructure in place which places the state at a competitive advantage in making best use of EHR information. These include multiple major research universities, pharmaceutical and biotechnology companies, and contract research organizations. Rapid growth in the utilization of EHRs will increase research activity, one of NC's major industries. Two of NC's four medical schools, UNC and Duke, are recipients of NIH Clinical Translational Science Award (CTSA) grants, which provide substantial infrastructure funding. Currently there are only 38 awards in the US, and having two in our state provides a significant advantage to NC. CTSA awards have mandated informatics cores, making collaboration with the growth of EHRs a logical extension of their initial work. CTSA's also possess ethics and regulatory cores to assure appropriate use of such clinical data. UNC Chapel Hill, for example, has spent several years and several millions of dollars to provide a research data warehouse for EHR information that has the capacity to link to national research databases. As noted above, several NC institutions have substantial infrastructure in place and experience with pharmacoepidemiology and comparative effectiveness research. UNC Gillings School of Global Public Health is a leader in population health research. UNC Charlotte has established substantial expertise and infrastructure in database analysis and data mining. The Renaissance Computing Initiative (RENCI) is a statewide resource. Close association with these organizations throughout the design and early implementation of a strategic plan will lead to more rapid implementation of research projects based on electronic health record data.

Existing Population Health IT Systems

NC Public Health, including state and local health departments, has a dual role in HIT. Public health includes both individual care level services and the population health services. The

organization of HIT in public health is organized under the concept of the Public Health Information Network (PHIN) and is consistent with the National Health Information Network (NHIN) standards. NC PHIN was initially built through the use of Federal Public Health Preparedness funds that came to states following the events of 9/11. The NC PHIN infrastructure provides 24/7/365 secure operations with high availability for applications that support the CDC Preparedness Goals. Listed below are some of the NC PHIN public health activity services provided.

- **Immunization Registry.** This system was implemented to record patient history of all required childhood immunizations and assists the provider in making clinical decisions regarding necessary treatment.
- **Partner Communication and Alerting.** NC Health Alert Network (NC HAN) is the alerting/communication system within NC PHIN and is designed to immediately alert appropriate users to health and bioterrorism threats. The services provide an effective method of ensuring that all appropriate personnel are notified via e-mail, pager and/or fax according to PHIN PCA requirements.
- **Disease and Case Management Services.** NC Electronic Disease Surveillance System (NC EDSS) is a disease surveillance, outbreak/case management and early detection system that allows public health users to receive, manage, process and analyze electronic data from public health entities, clinics, laboratories, hospitals and health care providers. NC EDSS services include support for required case or suspect case reporting of reportable diseases, electronic lab reporting, outbreak management, emergency situational awareness and GIS mapping capabilities.
- **Early Event Detection and Surveillance.** NC DETECT provides services for situational awareness, case finding, contact tracing and timely surveillance related to injuries, chronic diseases, environmental exposures and other public health concerns. Data from sources include: the State's hospital emergency departments, NC's poison control center, statewide emergency medical system (EMS) and other key surveillance source indicators.
- **Health Information System (HIS).** This system provides an automated means of capturing, monitoring, reporting and billing services provided in local health departments, children's developmental services agencies (CDSA) and the state lab. It is intended as a replacement for the outdated HSIS.

NC PHIN supports the national standards and objectives that are critical elements of a new NC HIE such as open source development, interoperability, HIE, and certified standards-based messaging.

Recommended Action Steps

- 1. Identify the standard required data elements to be reported to the State. To be most effective, registry data at the practice level must be rolled up to the region and ultimately, the state and national level to impact population health.**
- 2. Produce an annual report that compiles and analyzes the measureable impact of HIT on population health including cost, enhanced quality and safety, and efficiency of care delivered to NC residents.**
- 3. Provide training and technical assistance for understanding and using the population health data.**
- 4. Establish a mechanism to respond to requests from qualified researchers and make available data for biomedical research with the appropriate assurances for data use and confidentiality.**

FINANCING AND SUSTAINABILITY

HIT holds tremendous potential for health improvement, increased efficiencies, and controlling costs for the citizens of NC. However, this potential cannot be realized without a substantial expenditure of time and money. In particular, physicians and other healthcare providers will be required to re-engineer their business practices and install complex hardware and software to fully implement an EHR into their practices. Broad EHR adoption is the foundation of a successful HIE. While the benefits of a successful HIE are shared by all stakeholders, the costs of this transformation in healthcare delivery are largely borne by physicians and other providers. In many cases, the federal subsidies to providers under ARRA may not cover these costs.

In addition to the costs associated with individual providers there is a cost of designing, implementing, and maintaining a statewide technical infrastructure to enable electronic reporting and information sharing. A sound financial plan will require exploring multiple funding sources and attention to where the costs for implementing a strategic plan for HIT are truly borne.

Guiding Principles

- **Sustainability is essential to the success of HIT.** Sustainability involves the use of one time funds for IT infrastructure development and the identification of additional funding sources to maintain the system after implementation. Sustainability also refers to the need to educate consumers on the use and purpose of electronic health records; funds will be needed for this purpose as well. Health Information Technology needs to be recognized as part of the essential infrastructure for the State of North Carolina much as roads, bridges, power, and communications are for other economic purposes.
- **Funds must be used effectively.** Funds already invested in Health Information Technology will provide a building block for future investment and provide the necessary state match.
- **Funds will be leveraged.** Every effort will be made to utilize funds awarded to NC from ARRA in a manner that incentivizes providers to adopt, implement and use technology according to the state vision.

Summary of Existing Capacity and NC Expertise

North Carolina is fortunate to have several private foundations interested in improved health. These foundations have recognized the commitment and success of earlier health technology endeavors and have expressed an interest in helping the State move forward in the development of a statewide HIE system. Some foundations are:

- *Blue Cross and Blue Shield of North Carolina Foundation* has as its mission improving the health and well-being of North Carolinians
- *Duke Endowment* is a private foundation serving the people of North Carolina by supporting selected programs in health care, children's services and other areas.
- *Golden LEAF Foundation*, which was created by the [General Assembly](#) as one of three entities to invest North Carolina's portion of the [Tobacco Master Settlement Agreement](#). Golden LEAF receives and distributes funds for economic impact assistance to economically affected or tobacco-dependent regions of North Carolina.

- *Health and Wellness Trust Fund* is another entity created by the General Assembly to invest the state's portion of the [Tobacco Master Settlement Agreement](#). HWTF invests in programs and partnerships to address access, prevention, education and research that help all North Carolinians achieve better health.
- *Kate B. Reynolds Charitable Trust* has as its mission to improve the quality of life and quality of health for the financially needy of North Carolina.

In addition, a number of Community Health Information Networks and Exchanges (CHIE) are operational or under development in North Carolina. The majority of these are hospital or health system sponsored and are geographically located all across the state. Tens of millions of dollars have been invested in HIT to serve their regions. Funding for operation of these CHIEs is identifiable and will be used as required match for ARRA funds.

States are addressing ongoing operational costs in a number of ways, and North Carolina should consider such options as user fees, transaction fees, membership fees and assessments on claims, and/or aggregating third party payers to provide incentives for provider use. Care should be taken that high fees do not discourage development or use of the HIT system, or that the need to find funding subvert the public policy goals of the enterprise.

North Carolina currently appropriates state funds to agencies and institutions that use the funds for HIT including education. These state appropriations have been identified for use as state match for ARRA funds or any other federal funds appropriated in the future to enhance the adoption, implementation and use of technology for improved health. Preliminary analysis of state expenditures for health information technology in the Department and Health and Human Services and in the UNC and ECU Health Systems finds about \$48 million that may be available as state match.

ARRA funds, funds appropriated by the state, and funds committed by foundations for the purpose of improving health through information technology will be coordinated to transition from one stage of implementation to another. ARRA grant funds may be used to build the infrastructure to support Health Information Exchange (HIE). Loans may be available to eligible providers to implement electronic medical records and develop connection points to the HIE. These steps will be timed so that providers are prepared to meet meaningful use definitions that will allow them to receive enhanced reimbursements from Medicare and Medicaid as soon as they are available.

Other incentives should be developed to encourage providers to implement EMRs and join the HIE at the earliest possible time. Two examples of such incentives are graduated per member per month (PMPM) fees in CCNC and agreement by insurers to target reimbursement rate increases to providers who are early participants in meaningful use of HIT as a complement to the Medicaid and Medicare incentive payments (similar to that done by Integrated Health Association in California). In addition, if the state adopts a limit on state sales tax rebate for health care facilities, an exemption or a higher limit should be considered for new or expanded HIT expenses.

Recommended Action Steps

- 1. Request boards of foundations to formally adopt resolutions to commit funds to the state HIT plan.**
- 2. Identify existing state appropriations available as match for ARRA funds.**
- 3. Prepare options for user fees, with an analysis of the potential effect of fees on system development, use and governance.**
- 4. Design a plan for graduated PMPM fees in CCNC that rewards early adopters of HIT, including EMRs and HIE.**
- 5. Seek commitments from major insurers to reward providers who are early adopters of HIT, including EMRs and HIE.**
- 6. Seek legislative support for a higher limit on state sales tax rebate for health care facility expenses related to new or expanded HIT.**

GOVERNANCE AND OPERATIONS

The Task Force concluded that the State of North Carolina would be best served by having a single, highly-visible point of accountability to govern NC HIT & HIE. Such an entity should be established and charged with the variety of roles and functions which are needed immediately and in the future to assure the aggressive deployment, appropriate use, evaluation and integration of HIT & HIE into the NC health and healthcare sectors. There are multiple state agencies and non-profit organizations who could fulfill this role.

The overarching governance structure may ultimately need to be an independent Public Authority chartered by the State of NC to perform the oversight associated with implementation of a strategic plan for HIT. Long term, it must have the necessary legal authority to set policy, require selected specific activities, and potentially generate funds to ensure the long term sustainability of the HIT infrastructure. The critical nature of HIT infrastructure is not unlike that of other important public utilities such as roads, safe water, and energy. However, the understanding of what is the best specific governance structure will evolve as the HIT Strategic Plan is implemented over the next 3-5 years. A Public Authority or any other governance structure that requires legislative action will take time to evaluate and emerge as the best model for HIT in NC.

Until such time as the best long term governance structure for NC is identified and implemented, a new **HIT Coordinating Committee** should be established by Executive Order of the Governor and members appointed by the Governor to immediately provide the leadership and organizational structure necessary to move forward with a strategic plan for HIT and enable NC to secure federal HIT Stimulus funds.

Guiding Principles

- **The Governance must support the overall mission and goals.** The governance structure and operations must further the goal of improving health and healthcare in NC as a primary responsibility that permeates all policies and operations.
- **The support of top leadership is essential.** The ability to bring the right people to the table, public and private, and keep them engaged will require the state's top leadership, the Governor and DHHS Secretary, to stay committed and involved.
- **Business must be conducted in an open and transparent manner.** The proposed governance entity is a public-private body that must conduct business in such a manner that it is open and transparent to the public. All stakeholders must have an opportunity to be heard and strict adherence to conflict of interest policies is essential.
- **The Governance entity must be small but representative.** The decision making body must be small enough to remain nimble and decisive but of sufficient size to be representative of the key stakeholders in HIT advancement. Subcommittees or affiliated workgroups may be established to assure a wider range of healthcare providers and interested parties have ample opportunity to be involved in the issues most important to them.
- **NC's efforts must align with other state and national HIT efforts.** The governance entity will have the responsibility to monitor other HIT activities and ensure NC HIT is well aligned whenever possible.
- **Clear lines of authority, roles definition and accountability must be established.**

- **Fairness to all participants is essential.** The HIT policies, programs, and infrastructure must not favor one group over another. The implementation of a strategic plan for HIT must be conducted in a provider neutral, practice setting neutral, and vendor neutral manner.
- **Private partnerships must be leveraged.** The HIT Strategic Plan should provide sufficient flexibility in the governance model to allow third party entities to bring forward solutions that would address the requirements of the plan and where appropriate provide broader value for the State, such as adding jobs and consolidating information.

Health Information Technology Coordinating Committee

The Health Information Technology Coordinating Committee (the “Committee”) would be an independent body of approximately 13 members appointed initially to staggered three year terms by state government. The members must be representative of the key stakeholders of a successful system of HIE in NC: consumers, licensed healthcare providers in active practice, hospitals, health plans, public health, supporting health services (e.g. clinical labs) and state government. The Committee should report jointly and directly to the Governor and the Secretary of DHHS.

The Committee will focus on policy, vision and strategic direction for HIT in NC. The Committee is expected to rely on contractual relationships with state agencies and independent, non-profit, public-private organizations to perform the detailed planning, implementation, program management and support functions associated with a strategic plan for HIT. This will allow the Committee to take full advantage of the strong leadership and experience of existing agencies and organizations already performing HIT related functions in NC. Utilization of existing expertise would ensure that the residents of NC receive the maximum value from enhanced HIT without imposing an undue burden on state government to execute the tasks associated with HIE operations. The Committee would publish an annual progress report to increase its accountability and monitor the progress of achieving the Strategic Plan’s goals for statewide HIT.

A new position should be established to serve as a leader and single point of accountability within State Government for coordination and implementation of a strategic plan for HIT. This new high level position of State Coordinator for HIT may be appointed by the Secretary of DHHS and would serve as the Executive Director and staff to the Committee.

The Committee, its contractors, associated committees and all associated work groups would be subject to strong disclosure and conflict of interest (avoidance) processes.

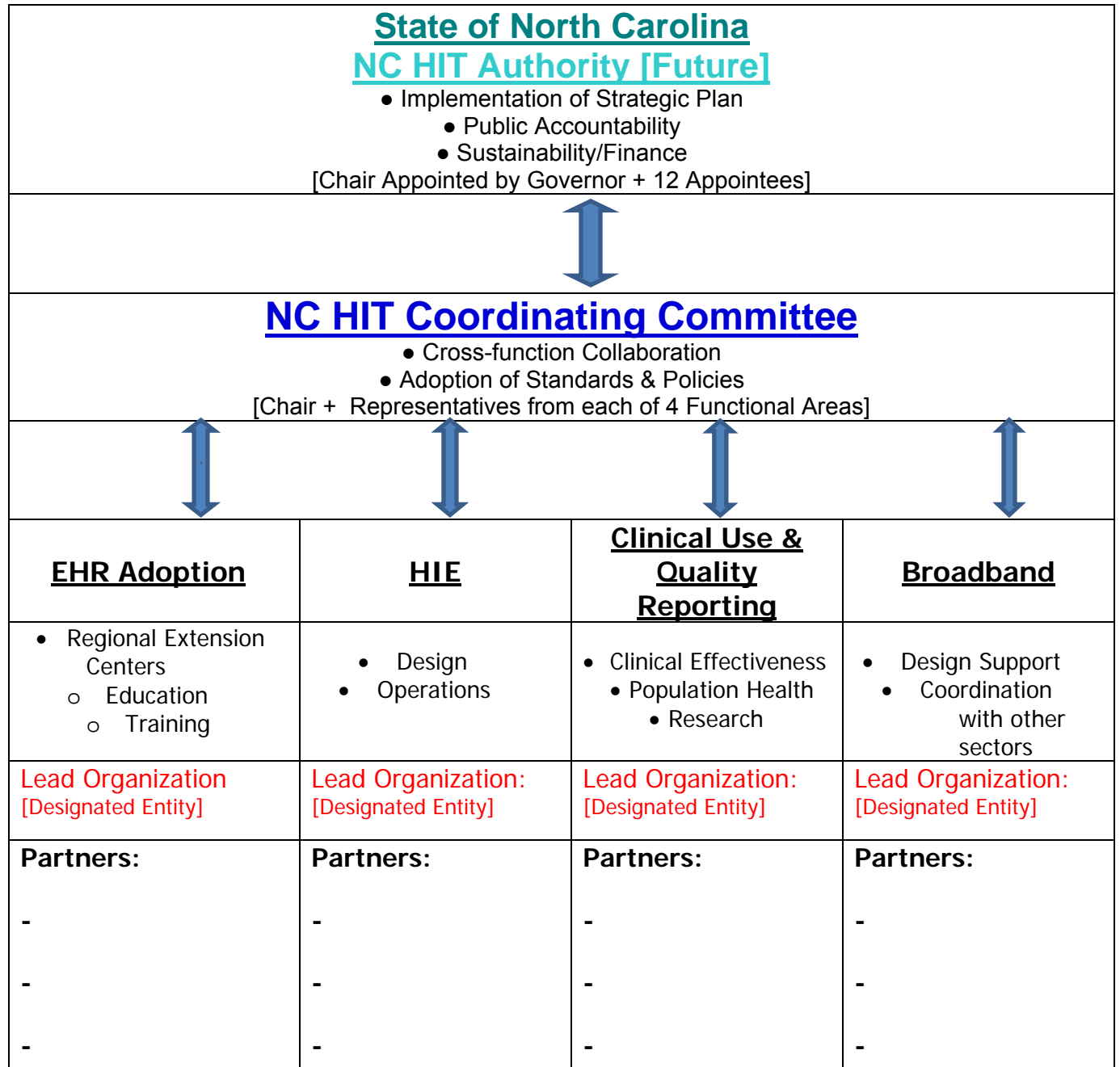
The HIT Coordinating Committee funding would come initially from a combination of federal, state and/or private philanthropic resources including ARRA HIT Stimulus funds.

The governance functions of the Committee would include:

- Prioritize strategies associated with design and implementation of a NC HIE;
- Coordinate and assist in the preparation of the NC application for ARRA HIT Stimulus funds;
- Establish measurement mechanisms to assess HIT progress against strategic objectives;

- Coordinate planning efforts and activities of state agencies associated with the implementation of a strategic plan for HIT;
- Contract with outside agencies and organizations as necessary to perform specific tasks associated with implementation of a strategic plan for HIT;
- Provide for arbitration and/or resolution of conflicting policy pressures, competing service interests and/or technological disputes by providing a venue for decision making where entities within the state require a governing body to adjudicate HIT-related issues;
- Foster the continued growth in technology for HIT. Ensure (by use of appropriate incentives) that access to information about individuals is not restricted by any provider or institution for unfair and unreasonable economic or competitive purposes; and
- Support policies and practices for the security and confidentiality of the health information of individuals, while facilitating the flow of information needed for patient safety and quality, public health, treatment, payment, healthcare operations and other authorized uses.

The proposed governance structure is shown below:



NC Leadership: Non-Profit, Public-Private Entity Involvement

The Committee will select the necessary independent, non-profit, public-private organizations to perform the **HIT Operations** and **HIT Support** functions associated with implementing a strategic plan for HIT. The selection of these organizations will be guided by the functional role needed to accomplish the task and the organization's history and experience. NC is blessed with existing leaders and organizational capacity in HIT that can speed our progress. By utilizing existing organizations, contracted to perform specific activities consistent with their expertise, and taking advantage of the successful programs and people already working in this area, NC can "leap frog" the typically slow start-up phase for such a large and complex initiative.

Selection Criteria for the "Designated Entity" and Contractual Partners:

- Have a corporate structure that will qualify the organization to receive federal funding to promote HIT including:
 - 1) Be designated by the state as eligible to receive awards;
 - 2) Be a not-for-profit entity with broad stakeholder representation on its governing board;
 - 3) Be able to demonstrate a commitment to develop information technology to improve health care quality and efficiency through the authorized and secure electronic exchange of health information;
 - 4) Maintain strong consumer involvement;
 - 5) Maintain nondiscrimination and conflict of interest policies that demonstrate a commitment to open, fair and nondiscriminatory participation by stakeholders; and
 - 6) Conform to such other requirements as the Secretary and/or the Committee may establish.
- Maintain a governing board that achieves a broad stakeholder representation. Suggested representation includes but is not limited to: Physicians, Hospitals, Public Health, Chief Information Officers, Nurses, Pharmacists, Emergency Medical Services, Medicaid, Behavioral Health, Laboratory, Dentistry, Federal Qualified Health Centers, and Consumers/Taxpayers.
- Demonstrate a history of success in the same or similar activities necessary to implement a strategic plan for HIT.
- Possess the knowledge, expertise, and capacity to be successful and fully accountable.

HIT Operations

A key function of the Committee will be to partner with state agencies and non-profit organizations to deliver on the NC Strategic Plan in the four key areas that will yield the greatest value to NC from the ARRA HITECH stimulus funds:

(1) EMR Adoption—Facilitate very quickly the broad adoption of Electronic Health Records/Electronic Medical Record (EHR/EMR) capabilities by healthcare providers.

Perform an HIT Adoption role for NC designed to:

- Utilize "Quality targets" for HIT adoption to drive adoption priorities;
- Leverage Personal Health Records (PHRs) for the residents of NC;
- Encourage adoption of EHRs by clinicians and hospitals;

- Maximize NC providers’ achievement of “meaningful use” of EHRs including electronic prescribing that will qualify for ARRA incentive payments by 2011;
- Develop strategies for sustainability of statewide HIT infrastructure; and
- Report plans and progress on adoption efforts.

Suggested Partners: Community Care of NC (CCNC), Carolinas Center for Medical Excellence (CCME), NC Area Health Education Centers (AHEC), NC Medical Society Foundation Community Practitioners Program (NCMS)

(2) HIE Infrastructure—Development of a statewide, interoperable Health Information Exchange (HIE) infrastructure. The HIE capacity consists of three main components.

- **Interoperability**—The ability of the provider to collect and prepare the right information (CCD data elements) for sharing.
- **Exchange**—The ability of the provider to accomplish the actual exchange.
- **Availability**—The ability of the provider to reliably and consistently provide the information as needed on a 24/7/365 basis.

Plan, develop and operate a statewide NC Health Information Exchange (NC HIE) and a public Community Health Information Exchange (CHIE) as follows:

Utilize a Committee on HIE to provide advice on operation of the statewide and public CHIEs and coordination with other operating entities throughout the state. The Committee on HIE would be comprised of members representing CHIEs from across the state. Every effort would be made to assure broad geographic representation, diversity, and existing HIT networks. The responsibility of this Committee would be assuring the development of a sufficient number of quality community, regional or statewide HIEs so that statewide coverage for HIE is achieved. It would utilize the HIT Support function to implement rules to facilitate the appropriate access, exchange and tracking of health information between HIEs to any statewide entity (public health, Medicaid, etc), between CHIEs, other State and Federal HIEs and independent users. This Committee would not restrict any reasonable entity from full participation in the HIE network assuming it meets the minimum requirements to do so. Finally, this Committee would set rules and work to resolve disputes that may arise with respect to HIE participation.

Suggested Partners: State agencies, large academic medical centers, NC Health Information and Communications Alliance (NCHICA), Health and Wellness Trust Fund (HWTF), and large HIT vendors.

(3) Quality Reporting—Enable quality measurement and reporting. An essential component in enabling providers in NC to qualify for stimulus funding is the development of efficient methods of quality measurement and reporting. Developing this capability will require leadership and collaboration by key NC organizations which already devote significant time and resources to improving the quality and safety of healthcare including public reporting and quality improvement measures.

Suggested Partners: NC Health Care Quality Alliance, the NC Hospital Center for Quality and Patient Safety, the Carolinas Center for Medical Excellence, the NC Medical Society’s Quality Improvement Committee, the NC Center for Public Health Quality, the Pharmacy Quality Alliance, and others

(4) Broadband Connectivity—Assure appropriate internet connectivity to support HIE
Broadband connectivity is crucial to enabling the meaningful use of EHRs. NC is a large urban and rural state that made significant progress in building the “information highway” statewide. However broadband access is not yet universal across public and private sectors in all areas of the state. ARRA stimulus funding will be critical to expanding broadband access especially for rural healthcare providers. The NC HIT Coordinating Committee must work closely with the state designated entities planning and implementing expanded broadband capacity in NC including but not limited to the “Public Middle Mile Initiative”.

Suggested Partners: e-NC Authority, NC Rural Internet Access Authority, NC Information Technology Services, Microelectronics Center for North Carolina, NC Research and Education Network, NC Biotechnology Center,

HIT Support

The Operations goals will be supported by establishing relationships with key NC organizations that will provide services and support necessary to fulfill the HIT Strategic Plan including:

- Educate the workforce to be effective adopters and users of EHRs;
- Communicate the benefits and risks of HIT to residents of NC;
- Provide a conduit for legal and policy advice for HIE within the state;
- Facilitate the development of privacy and security mechanisms for healthcare stakeholders in the state;
- Develop best practices for IT professionals at NC healthcare providers;
- Support compliance with HIPAA transactions and code sets for healthcare; and
- Inform the Authority of developments on the local, state and national level.

A key component in the HIT Support area is education and training. This needs to be accomplished through a strong coupling and collaboration with the outstanding educational and training capabilities in NC that will be enabled through the Medical/Clinical Education Advisory Committee.

Medical/Clinical Education Advisory Committee—There is the need for an independent consortia comprised of representatives of the major academic medical centers (AMCs), professional medical education programs, nursing schools (four year and community college based), Area Health Education Centers (AHEC), allied health schools, dental and pharmacy schools. This entity is expected to grow out of the effort to assure NC will achieve a significant portion of the ARRA HIT Education and Tracking funds. This collaboration would plan the integration of HIT into all health professionals’ training and practice programs to optimize the quality, effectiveness and efficiency of health care delivery in the future.

A similar committee would also be established to support the HIT Coordinating Committee around legal issues surrounding privacy, security, and HIPAA transactions.

NC HIE TECHNICAL ARCHITECTURE APPROACH

A state-level, interoperable technology platform and governance entity, positioned between government and the healthcare sector, with a mission to advance statewide HIE, provides distinct and valuable advantages that serve the public good. These advantages include:

- Ensuring that HIE develops beyond corporate and organizational silos to serve all statewide stakeholders and their data needs;
- Facilitating collaboration, rather than competition, between healthcare providers related to data sharing to achieve the public good derived from mobilizing a full range of clinical and other information; and
- Serving public policy interests and addressing consumer protection concerns by facilitating widespread and effective data sharing practices for maintaining the confidentiality of health information.

Guiding Principles

- **Compatibility with the NHIN standards for interoperability must be maintained.**
- **Specifications should be vendor neutral, allowing for implementation in the widest range of hardware and software, including open-source and proprietary operating systems, programming languages, and connectivity tools.**
- **Wherever possible Services Oriented Architecture (SOA) design principles and Web Services should be utilized.**
- **Privacy and security aspects of all transactions and databases must to ensure compliance with HIPAA requirements.**
- **Strong standards-based authentication methods must be used in transactions with all external entities.**
- **Empower consumer consent regarding the sharing of their health information (though there may be limited exceptions to this guiding principle in cases where otherwise governed by state or federal law or for emergency access).**
- **Connection to the NC HIE will be enabled by participation in Community HIEs and state-level entities such as DHHS, Medicaid, statewide insurance companies and labs.** In general, participation will be by established standard formats and mechanisms wherever possible. Non-standard connections will be considered where necessary to promote participation.

Architecture as Defined by NC HIE

The term “architecture” is used in a wide variety of contexts to describe an orderly arrangement of parts. City planning is a form of architecture in that it is ensuring that various parts (roads, sewage, housing developments and recreational facilities) work together to meet growth and social requirements. In the architecture of a network, the “parts” are generally subsystems and interfaces. For example, in the architecture of the Internet, the subsystems are clients and servers. The Internet architecture is similar to city planning in that it attempts to govern best by governing least. By defining a few general subsystems and focusing primarily on the interfaces, it balances the conflicting goals of coordinating disparate elements and providing flexibility for innovation.

The subsystems of the NC HIE actually will be the networks of a variety of stakeholder organizations, both public and private. At any point in time these networks will be in different stages of their life cycles, will be built on many different technologies, and have differing capabilities and views of the data they collect. A goal in enabling the NC HIE is to follow the city planning approach, by focusing on standards-based technology neutral interfaces to create a “network of networks” so that participation in the NC HIE can be established over time, and will not require abandoning existing HIE systems.

NC Health Information Exchange Network (NC HIE)

Essential to the plan for interoperable health information technology is the creation of an NC Health Information Exchange Network (NC HIE) architecture that will securely and accurately connect consumers, providers and others, who have or use health-related data and services, while protecting the confidentiality of health information.

The NC HIE should use Service Oriented Architecture processes and procedures to interconnect health information exchanges and the users they support. A Service Oriented Architecture (SOA) aims at a loose coupling of services with other technologies that underlie applications. This architecture minimizes dependencies between systems. SOA separates functions into distinct units, or services, which developers make accessible over a network in order that users can combine and reuse them in the production of applications. These services communicate with each other by passing data from one service to another, or by coordinating an activity between two or more services.

The basic level of information exchanged across the HIE is defined by the Continuity of Care Document (CCD). The CCD is defined by national standard-setting groups and includes the essential administrative and clinical information about a healthcare event or encounter.

Creating the NC HIE architecture is a substantial challenge. There are issues of scale, complexity, protecting privacy, working with existing IT systems and ensuring that the NC HIE architecture approach does not unnecessarily hamper innovation in existing health IT systems. Accordingly, the Office of the National Coordinator for Health IT (ONC) piloted potential architectures for health interoperability based on specific prototypes. These prototype architectures each validated important basic principles that underlie the current approach to the NC HIE architecture. These principles include:

- The possibility of operating the NC HIE Architecture as a network without a central database of clinical information;
- The criticality of common standards and data format for developing the NC HIE architecture, particularly in the way that component exchanges interact with each other;
- Consumer controls can be implemented to allow consumers to exercise their rights regarding the sharing of their information; and
- The evolutionary approach moves toward interoperability but avoids wholesale replacement or modification of existing healthcare information systems.

NOTE: Conceptual Diagrams of Potential Technical Architectures for a NC HIE are included in the Appendix.

Summary of Existing Capacity and NC Expertise

As defined by the Office of the National Coordinator (ONC), Health Information Exchange (HIE) is the electronic movement of health-related information among organizations according to nationally recognized standards. The examples below depict cases of how data is shared within healthcare systems that exist in the State; however this is not meant to imply compliance or certification by national standards.

Existing Government Exchange Networks

Medicaid—Medicaid is the single largest payer in North Carolina, and indeed in most states. The Community Care of NC manages a portal for the care and treatment of high-risk Medicaid recipients. This portal is used by Community Care of North Carolina (CCNC) networks and Medicaid as a quasi-case management system, not a formal HIE, since there is no Master Patient Index (MPI). CCNC has access to a Medicaid claims data file and is building enhanced capabilities to share information between networks. This is typical of health information web portals around the state that are “home grown” and evolved over time to meet the basic business needs of an organization. The move toward electronic health records and interoperable, electronic health information exchange will greatly enhance CCNC’s efficiency and cost effectiveness.

Centers for Medicare and Medicaid Services (CMS)—CMS is currently implementing a new MMIS called MITA (Medicaid Information Technology Architecture). The MITA initiative envisions moving from traditional MMIS to web-based, patient centric systems that are interoperable within and across all levels of government. CMS has been working on MITA for approximately 5 years, and it is estimated it will take another five to ten years to arrive at a fully implemented and interoperable system. This system utilizes SOA and contains support for CCD information. CMS recently completed a joint initiative with HHS' Substance Abuse and Mental Health Administration (SAMHSA) to provide an SOA Framework for their trading partners. They are also working with the Office of the National Coordinator's Federal Health Architecture team to foster interoperability with the Centers for Disease Control and Prevention, the VA and the Department of Defense. (NOTE: Reference information is available at: http://www.cms.hhs.gov/MedicaidInfoTechArch/02_MITAWhitePapers.asp#TopO.)

Existing Regional Consumer-Focused Networks

There are two preeminent data sharing systems operating in North Carolina at this time: the Western North Carolina (WNC) Health Network’s Data Link Project, and the University Health Systems of Eastern Carolina HealthSpan Project. The below provides an overview of how data is shared within these two healthcare systems:

Western North Carolina Data Link—Date Link is a collaboration among 16 hospitals and uses a federated model which draws upon non-centralized repositories of patient data. This enables clinicians to view healthcare data that is stored on disparate software systems not owned or managed by their hospital. It is technology neutral, connects to a variety of health information systems using HL7 messaging, and utilizes an MPC (Master Patient Cache). A central web portal allows authorized physicians to view patients’ electronic records across all WNC hospitals by querying the 16 hospitals’ EMR systems.

At this time, Data Link serves as a portal for viewing and printing purposes only; no patient data is automatically transferred from one hospital to another in the network. Since physicians cannot update the specialized nature of these organizations, they may require only a subset of the shared architecture (standards, services and requirements) and processes and procedures used by the other participants.

University Health Systems of Eastern Carolina HealthSpan—HealthSpan is managed by the University Health Systems of Eastern Carolina using a SaaS (Software as a Service) model, which is hosted by Pitt County Memorial Hospital. This system is based on a consolidated model which utilizes a central repository to manage most of the information exchange. HealthSpan runs on the Epic Enterprise software suite and users gain access to the EPIC software via a web-based connection.

Currently, six hospitals and three clinics are members of HealthSpan. There are approximately 1.2 million patient records in the system. The entire patient record is available to participating clinicians, including radiology/EKG images and results. Results from commercial labs are interfaced directly into the system. In the coming months HealthSpan is planning to add ePrescribing functionality to retail pharmacies, five to ten ambulatory practices (owned or affiliated) and a patient portal.

Existing Population Health Networks

NC Public Health, state and local health departments organize HIE under the Public Health Information Network (PHIN) according to NHIN standards. The NC PHIN infrastructure provides 24/7/365 operations with high availability for applications that support CDC Preparedness Goals. As described previously on page 27, the existing NC PHIN HIT activities include:

- Immunization Registry
- Partner Communication and Alerting
- Disease and Case Management Services
- Early Event Detection and Surveillance
- Health Information System for Public Health (HIS)

General Functionality of the NC HIE

The NC HIE would serve four basic roles:

1. A connection point for Community HIEs in North Carolina to enable them to interconnect with each other and to HIEs in other states;
2. A connection point for state-level entities (such as Public Health and payers) to connect to regional NC HIEs and to HIN, HIEs, RHIOs in other states;
3. Connection points for individual providers who do not participate in a CHIE or elect to participate in a sponsored HIE outside NC; and
4. A connection point from NC HIE to the Nationwide Health Information Network (NHIN).

Architectural Requirements

- Security through out the system
- Consumer privacy assured
- Continuity of Care Document (CCD) as a foundation
- Scalability and performance
- Auditing and Logging
 - Published interfaces for interoperating in key functional areas
 - User Authentication and Access Control
 - Security Policies
 - Data de-identification
 - Individual identity protection
 - Individual identity resolution within and across domains

Requirements of Use Cases

These use cases are to be implemented within NC HIE

- Core Services / Clinical Messaging
- Medication Management including e-Prescribing
- Electronic Laboratory Reporting
- Image Sharing (X-ray, MRI and CT scans)
- Other cases

These use cases are to be implemented between NC HIE and other HIEs

- Consumer look up
- Consumer continuing care health information exchange
- Other cases

“Meaningful Use” as Delivered by the NC HIE May Include Some or All of the Following Functional Demonstrations

- Public health alerts: Provide the capability within NC HIE that enables city and county health departments to issue public health alerts to a certain number or all of the hospitals and physician offices in the county.
- Provide automated required reportable disease compliance: Provides functionality to allow hospitals and other providers to send reports to public health as soon as a reportable disease is detected.
- Improve care for patients: Provide access to key patient information for prompt and better decision making capabilities for provider including but not limited to e-Prescribing.
- Improve efficiency for providers: Reduce unnecessary duplication of services and costs.
- Enable exchange of electronic health information to improve the quality of care: NC HIE will provide the health domain infrastructure to enable interoperability more efficiently and cost effectively.

From the Markel Foundation:

- Allow for a broad range of providers to participate through a variety of mechanisms;
- A range of metrics and validation mechanisms will be needed to enable a wide diversity of providers in different practice settings and with varying systems—including primary care providers, specialists and hospitals—to demonstrate meaningful use;

- Meaningful use should be demonstrable in the first years of implementation without creating undue burden on clinicians and practices;
- Information Policy and Technology Attributes that foster trust and enable sharing of vital health information;
- Clear and achievable (The metrics and the approach used to validate them should be clear and goal-oriented, and be achievable whenever possible through automatic reporting from electronic systems to avoid creating additional unnecessary reporting burden for clinicians);
- Motivate information use to improve health, but not over-specify how to get there;
- The metrics should not focus on specific features and functions of technology or software but rather on the use of information to innovate care processes that improve care coordination and medication management;
- Stimulate market innovation and “information rich” health IT adoption and use;
- Motivate market innovation for the development of increasingly usable, useful and scalable technology approaches that can be used to achieve and demonstrate health improvement goals; and
- Innovation toward high-value, more-affordable options is critical in the small-practice market, where adoption has been the slowest, costs for IT remain high and IT support is most lacking.

NOTE: Federal guidance from the Office of the National Coordinator is expected to clearly define the specific activities that will satisfy the meaningful use of electronic health record systems under the ARRA program for provider incentives payments.

APPENDIX

- 1. Health IT Task Force Membership**
- 2. Definitions of Commonly Used Terms and Abbreviations**
- 3. “North Carolina: Picturing Health Information Technology”** (Presentation by Tom Ricketts at the April 20, 2009 meeting of the HIT Task Force)
- 4. Selected Technical Architecture Models for a NC HIE**
- 5. Summary of Recommended Action Steps**
- 6. Synopsis of Public Comments**

NC Health Information Technology Strategic Planning Task Force

MEMBERS

Steve Cline, DDS, MPH (HIT Task Force Chair)
Deputy State Health Director
NC Division of Public Health
Raleigh, NC

Asif Ahmad, MBA
Vice President for Diagnostic Services and Chief Information Officer
Duke University Health System and Duke University Medical Center
Durham, NC

Benjamin Alexander, MD
Chief Medical Information Officer
Wake Med Pediatric Critical Care, Wake Med Health and Hospitals
Raleigh, NC

Holt Anderson
Executive Director
North Carolina Healthcare Information and Communications Alliance (NCHICA)
Durham, NC

Phil Brown, ThM, MA, NHA
Chair, NC Consumer Advisory Council on Health Information (NC CACHI)
Past president, North Carolina Senior Citizens Association
Carthage, NC

Hadley Callaway, MD
Raleigh Orthopaedic Clinic
Past president, North Carolina Medical Society
Raleigh, NC

Tim Carey, MD, MPH
Director, UNC-CH Cecil G. Sheps Center for Health Services Research
Sarah Graham Kenan Professor in the Departments of Medicine and Social Medicine, UNC-CH
Chapel Hill, NC

Sam Cykert, MD
Program Chief, Internal Medicine Teaching Program
Greensboro Area Health Education Center (AHEC)
Moses H. Cone Memorial Hospital
Former Director for Medical Education and Quality Improvement, NCAHEC Program
ONC Strategic Planning Technical Expert Panel
Greensboro, NC

Allen Dobson, MD, FAAFP
Chairman, NC Community Care Networks, Inc.
Vice President, Clinical Practice Development for Carolinas Health System
President, Cabarrus Family Medicine, Mt. Pleasant, NC
Former Assistant Secretary and Medicaid Director, NC DHHS

Laura Gerald, MD, MPH
Senior Medical Consultant, Community Care of North Carolina
Raleigh, NC

Stuart James, MBA, CHE
Chief Information Officer
University Health Systems of Eastern Carolina
Greenville, NC

Arlo Jennings, PhD
Vice President and Chief Information Officer
Mission Health Systems
Western North Carolina Health Network
Asheville, NC

Jill Moore
Associate Professor of Public Law and Government,
UNC School of Government
Chapel Hill, NC

Harry Reynolds
Vice President, Blue Cross Blue Shield of North Carolina
Chair, National Committee on Vital and Health Statistics
Durham, NC

Kevin Schulman, MD, MBA
Professor of Medicine and Business Administration
Duke University School of Medicine and Fuqua School of Business
Director, Center for Clinical and Genetic Economics at the Duke Clinical Research Institute
Associate Director, Duke Clinical Research Institute
Durham, NC

Samuel Spicer, MD
Vice President of Medical Affairs
New Hanover Regional Medical Center
President, NCHICA
Wilmington, NC

John Tote
Executive Director,
Mental Health Association in North Carolina, Inc
Raleigh, NC

SUBJECT MATTER EXPERTS

Jennifer Anderson, MHSA, PMP
Electronic Health Record Consultant
The Carolinas Center for Medical Excellence
Cary, NC

Jerry L. Ayscue, Vance County Manager
Representing Local Government
Henderson, NC

Clyde Brooks, MD
ECU School of Medicine
Greenville, NC

Janis Curtis
NCHICA Board Member
Associate Chief Information Officer, Entity Support Group
Duke Health Technology Solutions,
Duke University Health Systems
Durham, NC

Larrie Dawkins, CMPE
Chief Compliance Officer
University Compliance Office
Wake Forest University Health Sciences & Wake Forest University
Winston Salem, NC

Mike Fenton, Enterprise Architect
NC Information Technology Services
Raleigh, NC

Larry Forrister, Director, Information Technology
Division of Public Health
NC DHHS
Raleigh, NC

Mark J. Gregory, RPh
Vice President of Pharmacy and Gov Relations
Kerr Drugs
Raleigh, NC

Lisa Haire
Division of Mental Health, Developmental Disabilities, and Substance Abuse Services
NC DHHS
Raleigh, NC

Jim Hazelrigs
Division of Medical Assistance
NC DHHS
Raleigh, NC

Donald Horton, Vice President
Public Policy & Advocacy
Laboratory Corporation of America Holdings
Burlington, NC

Becky Hunter
Consumer Advocate
Chapel Hill, NC

Rebecca Kitzmiller, MHR, MSN, RN-BC
PhD Candidate and DHTS Doctoral Fellow
Duke University School of Nursing
Member, NC HIE Council
Durham, NC

Denny McGuire, MPA, CPM
NC Information Technology Services
Raleigh, NC

John McLamb, MS, PHDM
PHIN-NHIN Consultant
CDC PHIN CoP Council
Division of Public Health
NC DHHS
Raleigh, NC

Mona Moon
Chief Financial Officer,
North Carolina State Health Plan
Raleigh, NC

Angeline Sligh, Director
Office of Medicaid Management Information System
NC DHHS
Raleigh, NC

David Stratton, CGCIO
IT Manager
Capital Care Collaborative
Wake County Human Services
Raleigh, NC

Andrew Weniger, CPA
Project Manager
North Carolina Healthcare Information and Communications Alliance
Durham, NC

Billy Willis, Ph.D
Deputy State CIO
NC Information Technology Services
Raleigh, NC

EX-OFFICIO

Abena Asante
Kate B Reynolds Charitable Trust
Winston-Salem, NC

Terri A. Bryant
Golden LEAF Foundation
Rocky Mount, NC

John Dervin, Policy Office
NC Office of the Governor
Raleigh, NC

Lee Dixon
Fiscal Research Division
NC General Assembly
Raleigh, NC

Allen Feezor
Deputy Secretary for Health Services
Office of the Secretary
NC DHHS
Raleigh, NC

Dan Gitterman, Sr. Policy Advisor
NC Office of the Governor
Raleigh, NC

Katie Eyes
Program Manager, Health of Vulnerable Populations
BCBSNC Foundation
Durham, NC

Jennifer Hoffmann
Office of State Budget and Management
Raleigh, NC

Lin Hollowell
Health Care Division
The Duke Endowment
Charlotte, NC

Daphne Lyon
Office of Economic Recovery and Investment
Raleigh, NC

Vandana Shah, Executive Director
Health and Wellness Trust Fund
Raleigh, NC

Jonathan Womer
NC Office of State Budget and Management
Raleigh, NC

STAFF SUPPORT

Carla Moore
Administrative Assistant
Division of Public Health
NC DHHS
Raleigh, NC

Sandra K. Trivett, MPA
Special Projects Office
Office of the Secretary
NC DHHS
Raleigh, NC

Jim L. Williams
Research Analyst
Office of the Secretary
NC DHHS
Raleigh, NC

Definitions of Commonly Used Terms and Abbreviations

NOTE; This section borrowed significantly from other documents including the ARRA and from “An Unprecedented Opportunity: Using Federal Stimulus Funds to Advance Health IT in California”, prepared by the California HealthCare Foundation.

American Recovery and Reinvestment Act of 2009 (ARRA): a \$787.2 billion stimulus measure, signed by President Obama on February 17, 2009, that provides aid to states and cities, funding for transportation and infrastructure projects, expansion of the Medicaid program to cover more unemployed workers, health IT funding, and personal and business tax breaks, among other provisions designed to "stimulate" the economy.

Centers for Medicare and Medicaid Services (CMS): a federal agency within the United States Department of Health and Human Services that administers the Medicare program and works in partnership with state governments to administer Medicaid, the State Children's Health Insurance Program (S CHIP), and health insurance portability standards (HIPAA).

Certification Commission for Healthcare (CCHIT): a recognized certification body (RCB) for electronic health records and their networks, CCHIT is an independent, voluntary, private-sector initiative, established by the American Health Information Management Association (ANIMA), the Healthcare Information and Management Systems Society (HIMSS), and The National Alliance for Health Information Technology.

Congressional Budget Office (CBO): a congressional agency whose mandate is to provide Congress with objective, nonpartisan, and timely analyses to aid in economic and budgetary decisions on the wide array of programs covered by the federal budget, and the information and estimates required for the Congressional budget process. See also Personal Health Record (PHR).

Continuity of Care Document (CCD): The CCD is an emerging standard for data elements and medical record format that is being more widely accepted by providers and patients. The HL7 Continuity of Care Document (CCD) is the result of a collaborative effort between the Health Level Seven and ASTM organizations to “harmonize” the data format between ASTM’s Continuity of Care Record ([CCR](#)) and HL7’s Clinical Document Architecture ([CDA](#)) specifications. The CCD shares *summary information* about the patient in an easy-to-read format, using [CCD templates](#) to constrain the data. The information can be read by the human eye or processed by a machine (such as an EMR system), and can be sent electronically or manually carried by the patient.

CCD is widely compatible with new and existing technology/standards because it is based on HL7 CDA - a RIM-based specification. It can work with existing applications, browsers, EMRs and even legacy systems. Because of its small fixed XML tag set, CCD can be rendered as HTML or PDF, and requires no specialized communication efforts or changes to existing processes.

Electronic Health Record (EHR): An EHR is defined by ARRA as “an electronic record of health-related information on an individual that is created, gathered, managed, and consulted by authorized health care clinicians and staff.” It may include information from more than one provider or EMR.

Electronic Medical Record (EMR): An EMR is an IT system for use by clinicians that contains patient-centric, electronically maintained information about an individual's health status and care, focuses on tasks and events directly related to patient care by a specific provider.

Federal Communications Commission (FCC): the United States government agency charged with regulating interstate and international communications by radio, television, wire, satellite, and cable.

Federal Financial Participation (FFP): the percentage of EHR adoption incentive funding set out in the stimulus package that will be provided by the federal government (as opposed to states) under the Medicaid program.

Federally Qualified Health Centers (FQHCs): safety-net providers such as community health centers, public housing centers, outpatient health programs funded by the Indian Health Service, and programs serving migrants and the homeless. FQHCs provide their services to all people regardless of ability to pay, and charge for services on a community board approved sliding-fee scale that is based on patients' family income and size. FQHCs are funded by the federal government under Section 330 of the Public Health Service Act.

Health Information Exchange (HIE): An HIE is a means for sharing consumer-centric clinical information among providers and other healthcare-related organizations across individual enterprises. The “actors” or stakeholders include hospitals, clinics, physicians, pharmacies, laboratories, public health facilities, other health care providers, health plans and state agencies. The information to be shared includes health encounter claims, provider health records, state registries and other data as provided in the CCD. The goals are improved efficiency of care management processes, enhanced patient safety, and increased effectiveness of care. The Office of the National Coordinator and the National Alliance for Health Information Technology (NAHIT) defines Health Information Exchange as the electronic movement of health-related information among organizations according to nationally recognized standards.

Health Information Technology (HIT): as defined in the ARRA, Health Information Technology means hardware, software, integrated technologies or related licenses, intellectual property, upgrades, or packaged solutions sold as services that are designed for or support the use by health care entities or patients for the electronic creation, maintenance, access, or exchange of health information.

Health Information Technology for Economic and Clinical Health (HITECH) Act: collectively refers to the health information technology provisions included at Title XIII of Division A and Title IV of Division B of the ARRA.

Health Information Technology Research Center (HITRC): as set out in the ARRA, the Health Information Technology Research Center will be created by the Office of the National Coordinator to provide technical assistance and develop or recognize best practices to support and accelerate efforts by health care providers to adopt, implement, and effectively use health information technology that allows for the electronic exchange of information.

Health Information Technology Regional Extension Centers (RECs): as set out in the ARRA, Health Information Technology Regional Extension Centers will be created by ONC to provide technical assistance and disseminate best practices and other information learned from the Health Information Technology Research Center to aid health care providers with the adoption of health information technology.

Health Information Technology Standards Panel (HITSP): a cooperative partnership between the public and private sectors formed for the purpose of harmonizing and integrating standards that will meet clinical and business needs for sharing information among organizations and systems.

Health Insurance Portability and Accountability Act (HIPAA): enacted by Congress in 1996. Title I of HIPAA protects health insurance coverage for workers and their families when they change or lose their jobs. Title II of HIPAA, known as the administrative simplification (AS) provisions, requires the establishment of national standards for electronic health care transactions and national identifiers for providers, health insurance plans, and employers. The AS provisions also address the security and privacy of health data. The standards are meant to improve the efficiency and effectiveness of the nation's health care system by encouraging the widespread use of electronic data interchange.

Healthcare Provider: for the purposes of this report, are defined as those persons who are licensed by the NC to provide healthcare services and receive compensation. This includes but is not limited to physicians, physician extenders, nurses, dentists, pharmacists, and therapists.

Meaningful EHR User: as set out in the ARRA, a meaningful EHR user meets the following requirements: use of a certified EHR technology in a meaningful manner, which includes the use of electronic prescribing; use of a certified EHR technology that is connected in a manner that provides for the electronic exchange of health information to improve the quality of health care; and use of a certified EHR technology to submit information on clinical quality and other measures as selected by the Secretary of HHS.

Medicare Advantage Plans: health plans offered by private companies that contract with Medicare to provide beneficiaries with Medicare Part A and Part B benefits. Medicare Advantage Plans are HMOs, PPOs, or private fee-for-service plans.

Medicare Fee-for-Service (FFS): Medicare's traditional benefit option, under which beneficiaries may obtain care from any licensed provider willing to accept Medicare patients.

National Association of State Medicaid Directors (NASMD): a bipartisan, professional, nonprofit organization of representatives of state Medicaid agencies (including the District of Columbia and the territories). The primary purpose of NASMD is to serve as a focal point of communication between the states and the federal government and to provide an information network among the states on issues pertinent to the Medicaid program.

National eHealth Collaborative (NeHC): a public-private partnership (formerly AHIC Successor, Inc.) driving the development of a secure, interoperable, nationwide health information system. The National eHealth Collaborative was founded in 2008 to build on the accomplishments of the American Health Information Community (AHIC).

National Institute of Standards and Technology (NIST): the non-regulatory federal agency within the United States Department of Commerce whose mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology. NIST oversees the NIST Laboratories, the Baldrige National Quality Program, the Hollings Manufacturing Extension Partnership, and the Technology Innovation Program.

National Science Foundation (NSF): an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense...."NSF is the funding source for approximately 20 percent of all federally supported basic research conducted by America's colleges and universities, including mathematics, computer science, and the social sciences.

Nationwide Health Information Network (NHIN): is envisioned by ONC to serve as a secure, nationwide, interoperable health information infrastructure that will connect providers, consumers, and others involved in supporting health and health care.

Office of the National Coordinator (ONC): serves as principal advisor to the Secretary of HHS on the development, application, and use of health information technology; coordinates HHS's health information technology policies and programs internally and with other relevant executive branch agencies; develops, maintains, and directs the implementation of HHS' strategic plan to guide the nationwide implementation of interoperable health information technology in both the public and private health care sectors, to the extent permitted by law; and provides comments and advice at the request of OMB regarding specific federal health information technology programs. ONC was established within the Office of the Secretary of HHS in 2004 by Executive Order 13335.

Personal Health Record (PHR): A PHR is defined by ARRA as “an electronic record of [individually identifiable] information on an individual that can be drawn from multiple sources and that is managed, shared, and controlled by or primarily for the individual.”

Population Health: This effort assists agencies, health organizations, providers and citizens in analyzing and reporting on trends and alerting all interested parties on potential extended health issues. Population health is focused on the health outcomes of a group of individuals. It is an approach to health that aims to improve the health of an entire population. Population health addresses a broad range of factors that impact health on a population-level, such as environment, social structure, resource distribution, etc. From the IT perspective this is achieved through the use of databases, data warehouses/marts, data analysis, data transformation and display technologies.

Qualified Electronic Health Record (EHR): as defined in the ARRA, a qualified electronic health record (EHR) means an electronic record of health-related information on an individual that includes patient demographic and clinical health information, such as medical histories and problem lists, and has the capacity to: provide clinical decision support; support physician order entry; capture and query information relevant to health care quality; and exchange electronic health information with, and integrate such information from, other sources

Qualified State-Designated Entities (SDEs): as defined in the ARRA, [Qualified] state-designated entities (SDEs) shall be designated by a state as eligible to receive grants under Section 3013 of the ARRA; be a nonprofit entity with broad stakeholder representation on its governing board; demonstrate that one of its principal goals is to use information technology to improve health care quality and efficiency through the authorized and secure electronic exchange and use of health information; adopt nondiscrimination and conflict of interest policies that demonstrate a commitment to open, fair, and nondiscriminatory participation by stakeholders; and conform to other requirements as specified by HHS.

U.S. Department of Health and Human Services (HHS): the federal government agency responsible for protecting the health of all Americans and providing essential human services. HHS, through CMS, administers the Medicare (health insurance for elderly and disabled Americans) and Medicaid (health insurance for low-income people) programs, among others.

Appendix #3

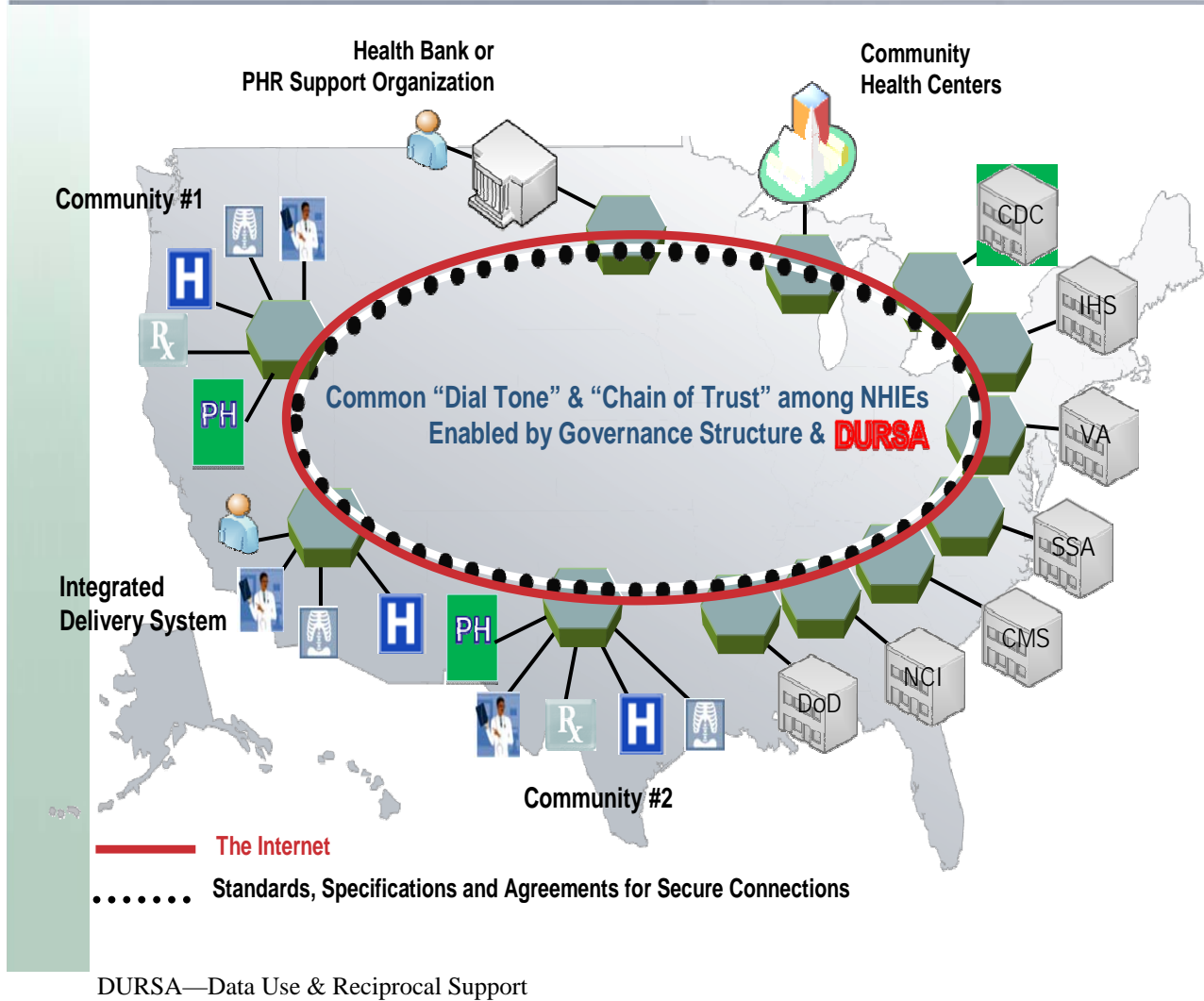
“North Carolina: Picturing Health Information Technology”

(Presentation by Tom Ricketts at the April 20, 2009 meeting of the HIT Task Force)

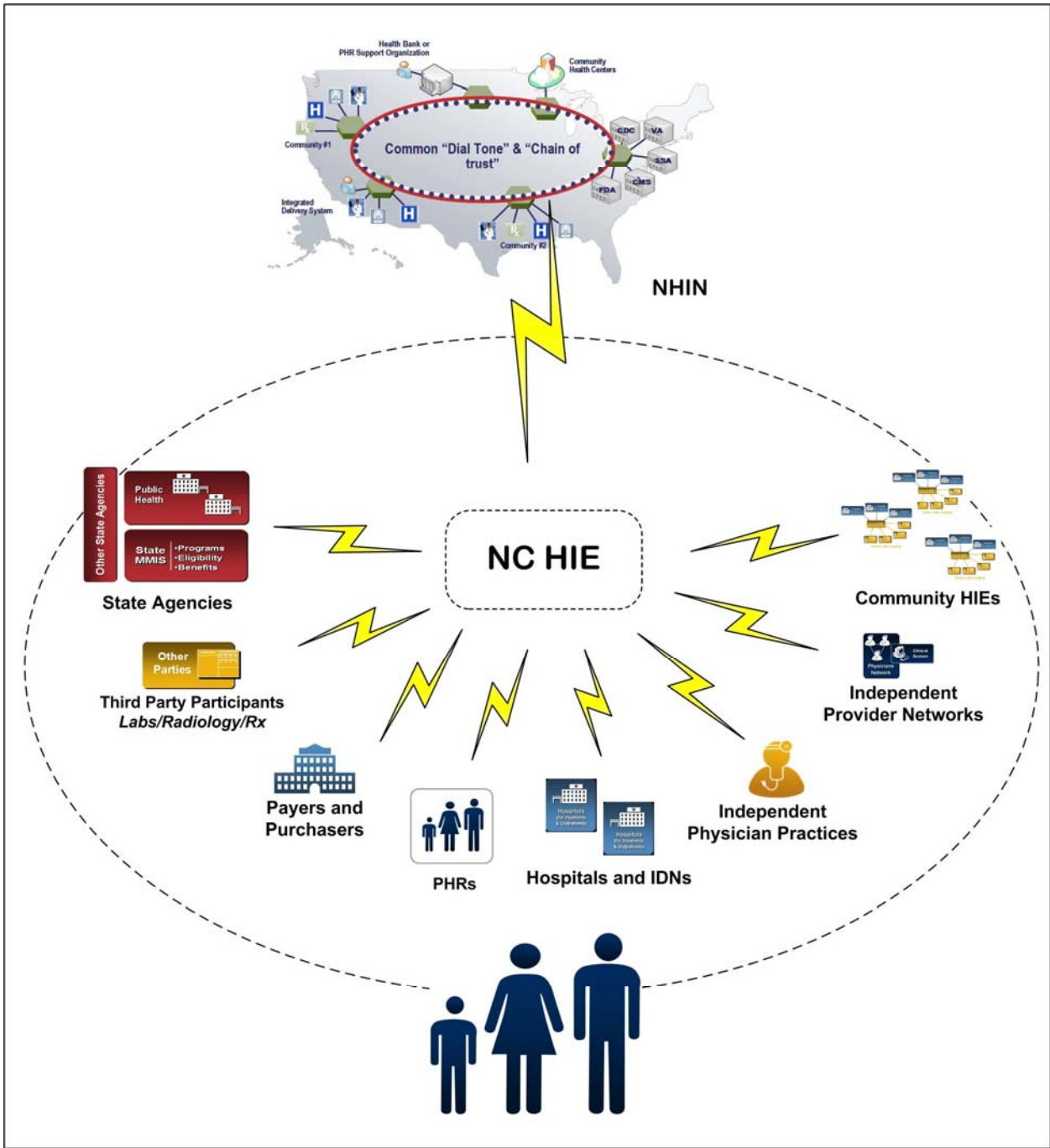
Please see attached file: NC HIT 2009V2.pdf

SELECTED TECHNICAL ARCHITECTURE MODELS

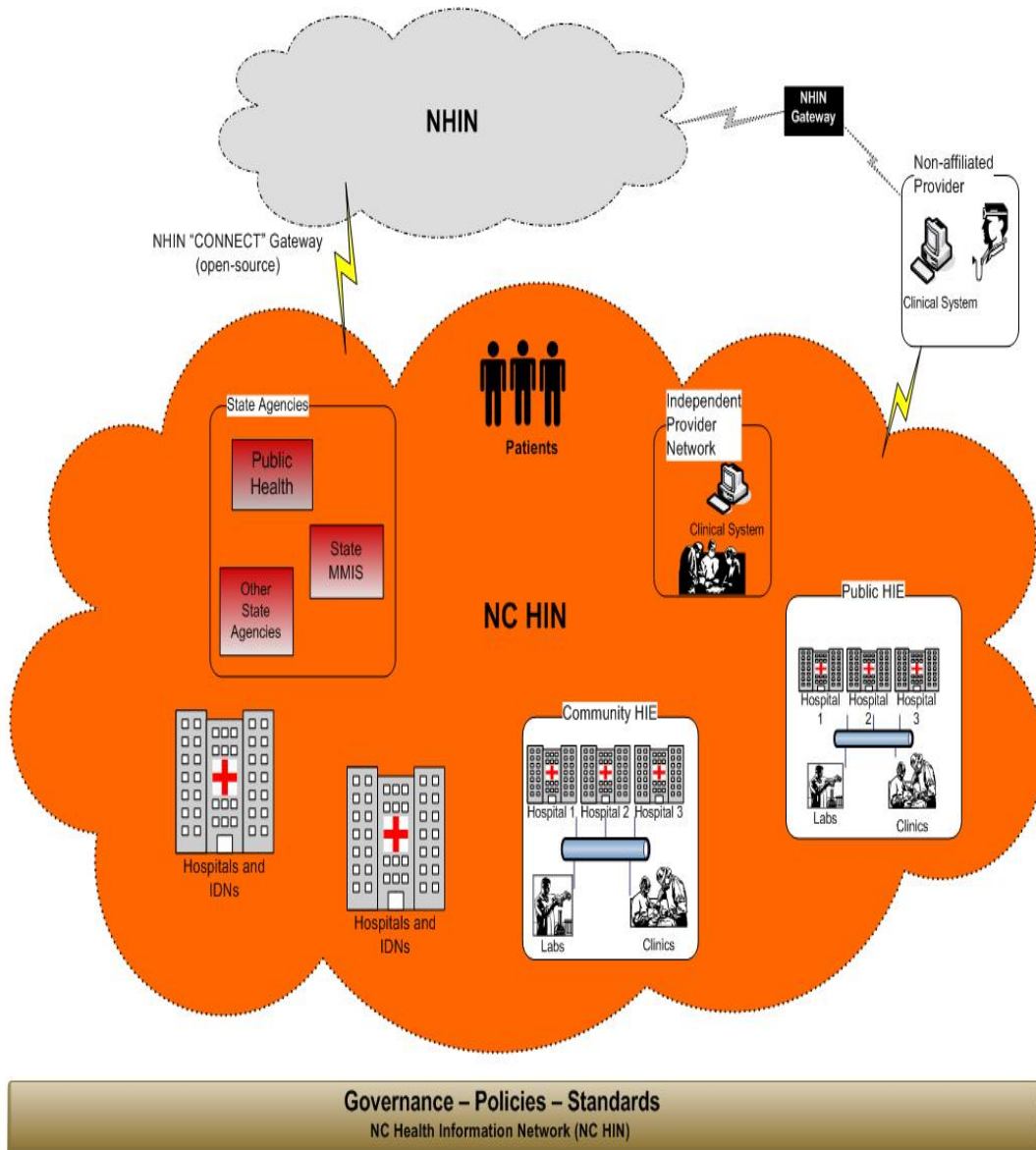
NHIN “Network of Networks”



A Concept Diagram Showing the National Health Information Network Linking Separate Health Information Exchanges Nationwide

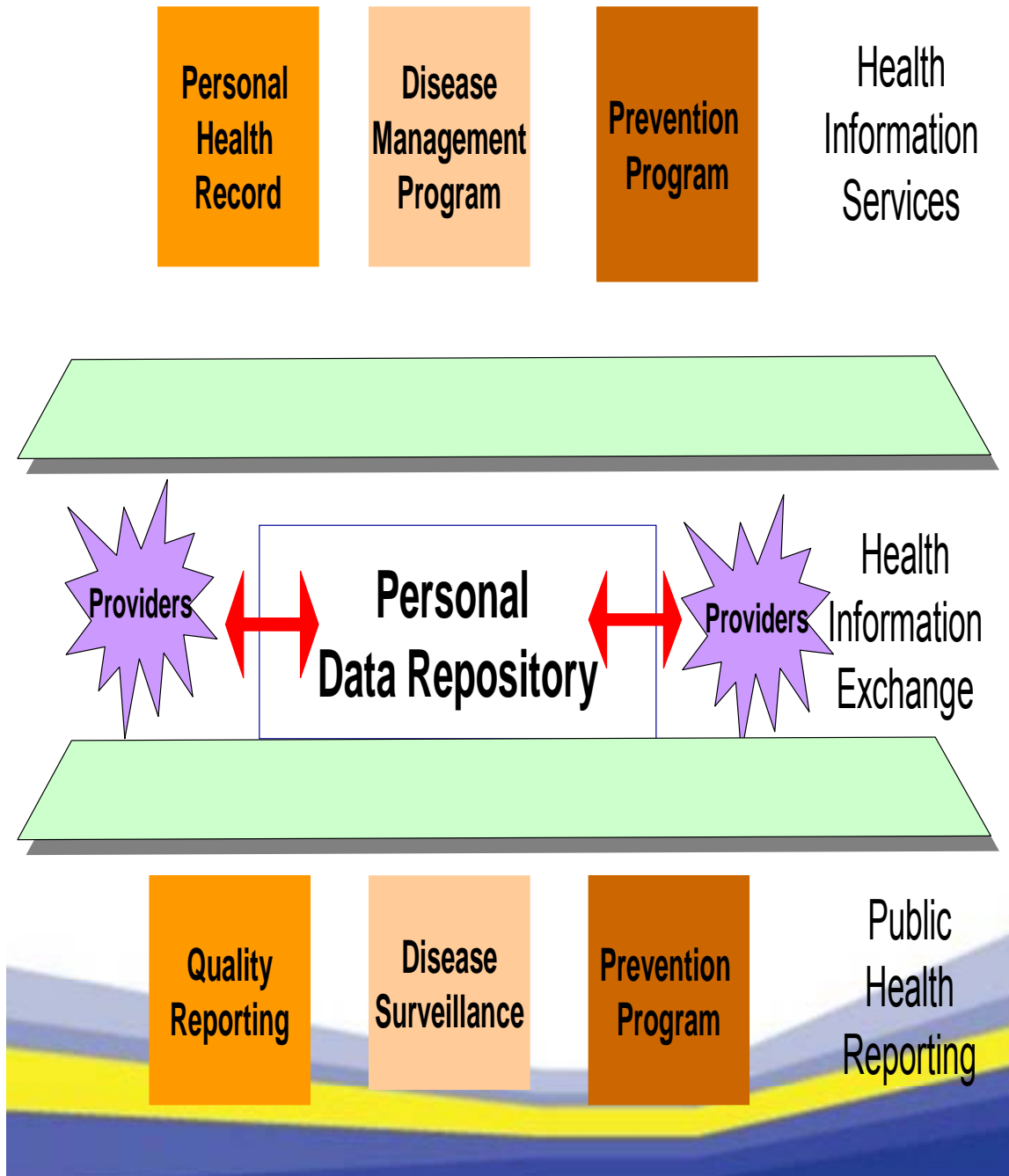


A Concept Diagram Showing the North Carolina Health Information Exchange As Part of the National Health Information Network



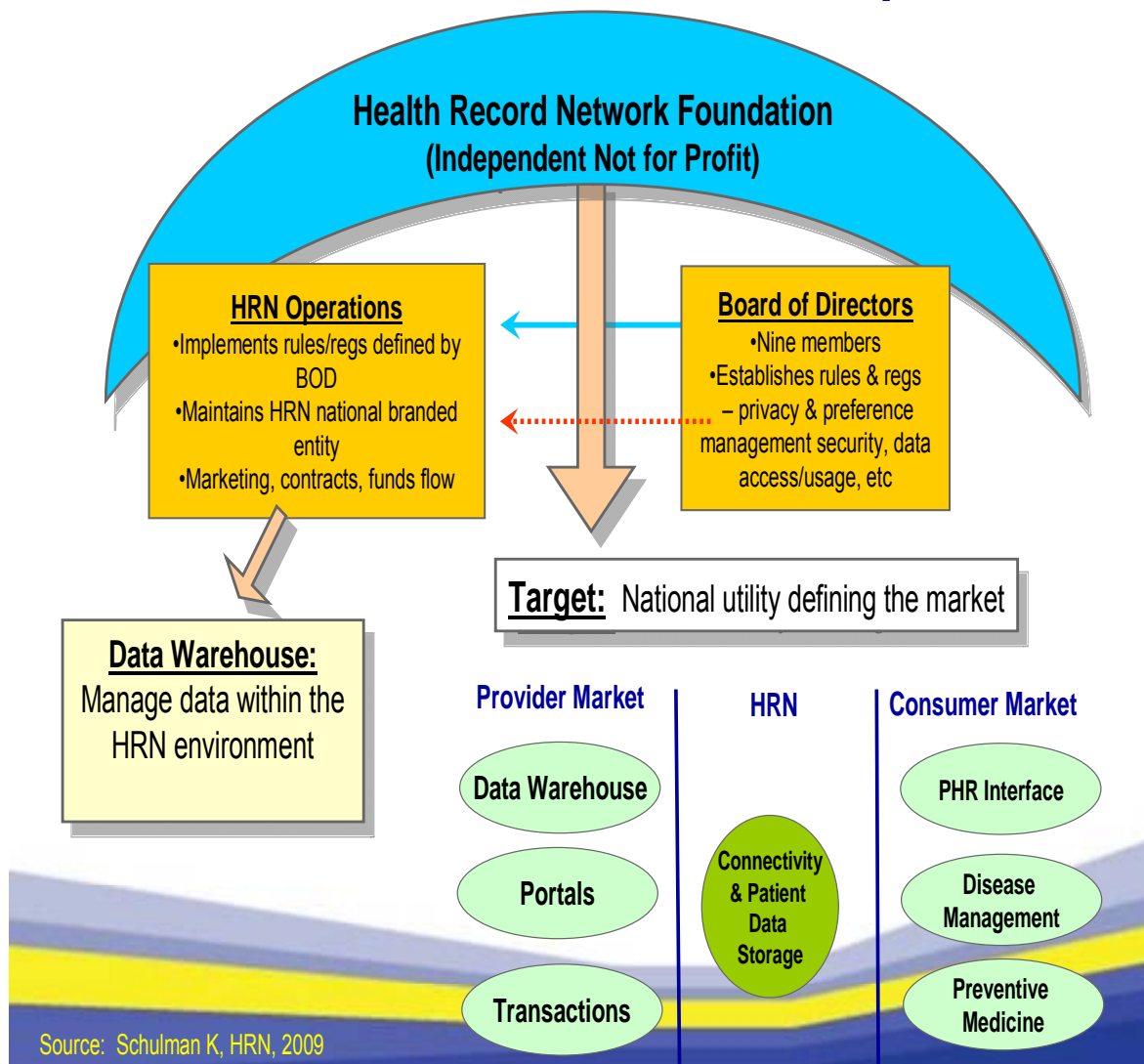
**A Concept Diagram of Cloud Technology
Linking the NC Health Information Network to the
National Health Information Network**

Network Architecture



A Concept Diagram of the Exchange and Use of Information in a Personal Data Repository

Structure for the Repository: Public, Private, Public-Private Partnership?



Concept Diagram of the Operational Relationships of a Health Record Network

RECOMMENDED ACTION STEPS BY CATEGORY

Summary

CONSUMER ACCEPTANCE	
1.	Assure substantive participation of consumers or consumer groups in the Governance Structure.
2.	Assure that the NC HIE system includes the appropriate access methods and development of tools for all types of consumers.
3.	Charge the proposed North Carolina Regional Extension Centers to provide training and support for consumers of healthcare to better utilize HIE.
4.	Create a committee to develop a specific plan, including the estimated cost and timeline, of a multi-pronged and multi-media outreach and training effort directed to the general population.
5.	Assure that HIT training for healthcare providers includes training on how to actively involve consumers in the use of HIT to encourage them to participate fully in decision making about their healthcare. Part of this task is to identify ongoing education and training needs of the future healthcare workforce.
PRIVACY AND SECURITY	
6.	Form public health law workgroup to propose changes that would consolidate and harmonize North Carolina's medical privacy and security statutes, with particular attention to statutes that affect electronic health information exchange.
7.	Educate health care providers, employers, and consumers about privacy and security of information in the "information age."
8.	Enact safe harbor(s) for release of, or access to, health information under certain limited circumstances (e.g., emergency treatment).
9.	Enact state law to expand, in a responsible manner, the list of persons and entities to which a clinical laboratory may release test results, beyond the ordering provider.
10.	Utilize standard model agreements for governing data sharing between entities
11.	Explore electronic consent directives and interstate compact addressing consent to release information and/or consistent privacy and security standards for electronic health information exchange between states.
12.	Utilize standards-based approaches to ensuring North Carolina stakeholders, <i>including consumers</i> , have adequately addressed the four "A's" of Security

(Authentication, Authorization, Administration and Audit) as privacy and security solutions are implemented.

HEALTHCARE DELIVERY

13. Develop an implementation plan for NC that provides a mechanism for all providers to build capacity for HIT.
 - This should include steps to ensure lower cost alternatives to “traditional” vendor supplied EMR software, including the use of open-source alternatives when appropriate.
 - The implementation plan should account for the need for a large number of providers in the state to increase HIT capacity in a rapid fashion, i.e. less than 2 years.
14. Establish a core capacity for EMR data collection and HIE.
Potential core capability:
 - Internet access with broadband capability (minimum of 10MB)
 - Primary clinical problem list
 - e-Prescribing
 - Laboratory results
 - Radiology results and images
 - Protocols for quality measure reporting
 - Standard information exchange capabilities to send/receive from other health entities and PHRs
 - Support for near real time clinical decision making
 - Interfaces to NC HIE for population health and secure registries on individuals.
15. Use CCNC as the starting point for implementation of the NC HIE with the understanding that lessons learned would be used to expand the program to all providers, patients and payers.
16. Facilitate a consortium of NC educational institutions/organizations to establish a Regional Extension Center to assure current and future providers are appropriately trained to optimize their use of HIT.
17. Assure a continuous flow of public health information from EHRs to the “designated entities” collecting such data, automatically and in standard formats.
18. Develop the measurable quality of care criteria for patient safety and health.
19. Develop the accountability standards that will measure the implementation and effective use of HIT.
20. Continually monitor the meaningful use and certification criteria as updated by CMS/Medicaid so that:
 - NC health professionals continue to understand and implement the necessary

- EHR capabilities to receive incentive payments
 - NC health professionals can insure that their EHR systems remain certified against national standards.

POPULATION HEALTH

21. Identify the standard required data elements to be reported to the State. To be most effective, registry data at the practice level must be rolled up to the region and ultimately, the state and national level to impact population health.
22. Produce an annual report that compiles and analyzes the measurable impact of HIT on population health including cost, enhanced quality and safety, and efficiency of care delivered to NC residents.
23. Provide training and technical assistance for understanding and using the population health data.
24. Establish a mechanism to respond to requests from qualified researchers and make available data for biomedical research with the appropriate assurances for data use and confidentiality.

FINANCING AND SUSTAINABILITY

25. Request boards of foundations to formally adopt resolutions to commit funds to the state HIT plan.
26. Identify existing state appropriations available as match for ARRA funds.
27. Prepare options for user fees, with an analysis of the potential effect of fees on system development, use and governance.
28. Design a plan for graduated PMPM fees in CCNC that rewards early adopters of HIT, including EMRs and HIE.
29. Seek commitments from major insurers to reward providers who are early adopters of HIT, including EMRs and HIE.
30. Seek legislative support for a higher limit on state sales tax rebate for health care facility expenses related to new or expanded HIT.

SYNOPSIS OF PUBLIC COMMENTS
HIT Strategic Planning Task Force Report
June 8-17, 2009

A draft of the HIT Strategic Planning Task Force Report was shared with the Task Force and participants during the June 1, 2009 public meeting of the Task Force as well as posted on the www.NCRecovery.gov website to facilitate wider distribution and to solicit public comment. More than 30 comments and letters were received from a broad cross-section of parties including doctors, nurses and other health care professionals, academics, retired military personnel, IT professionals and members of the public. In general, the comments received were very supportive of the vision and principles included in the report. A number of people commented favorably on the comprehensiveness of the report. There were also some minor specific suggestions for changes. Below is a brief compendium of selected comments received.

Paul R. G. Cunningham, MD, FACS, Dean and Senior Associate Vice Chancellor for Medical Affairs, The Brody School of Medicine at East Carolina University:

“There are many potential obstacles to implementation that are alluded to within that document. What may need to be emphasized even more, is the "shovel readiness" of North Carolina as a State, for implementation of a comprehensive health information strategy in the near term. Further emphasis may need to be given to the reality that there are regional deployments, already successful on a regional basis, that could clearly facilitate this further with more complete adoption.... The need for wide adoption, interoperability of systems and improvement of health care of the overall population would be best addressed through a regional process, using existing systems wherever possible it would seem.”

Gail L. Pruett, MSN, RN, Duke University Health System:

“Recommendations: More fully develop the idea of consumer involvement, no matter the amount of resources they possess, within the proposal. This development includes those consumers already on the margins of healthcare. Consider adding the thought that when funding arrives (optimistic!), address this population of disadvantaged people first. Consider adding the thought of engaging religious and civic organizations to engage this portion of our population. Include a focus on prevention as a fifth attribute of “meaningful use of certifies EHR technology” on page 19. Page 23, 2. Establish a core capacity for EMR data collection and HIE. Under the Primary clinical problem list, add a bullet, Primary prevention intervention list. Including prevention as a core need for data collection helps emphasize its importance. Page 24, Expected uses for population health. Add disease and injury prevention as item number”

Sharon Starr, Member of the public:

“Thank you for the chance to read this draft report. The document seems very comprehensive. All areas related to electronic medical records and health information technology seem to be covered. Consumer rights are included and privacy issues are discussed. The issue of the effect of culture is covered as well as disparities. All of these are vital areas to consider with a system such as this. I see a vital role for the community college in this process,

not only in education of future allied health and information technology students but also in training and education of employers and consumers. I hope the community college system will be represented in some way as this process evolves.”

Dinitia Hartman, Educational Account Manager, Sun Microsystems:

“Preventive care, chronic disease management and medical home - Simply stated these will cause profound changes in the care delivery model and this area receives a relatively small mention. This is HUGE and significant in terms of how medicine is currently practiced, e.g., allopathic approach. The models of encouraging preventive care, aggressive and efficient treatment of chronic disease and medical homes are very much alive and well in many of the European and Asian countries, e.g., Germany, Switzerland, Japan, yielding significantly lower costs when measured against GDP. This concept should be further detailed and elaborated on since it will effect all other components of how care is delivered.”

NC Prevention Partners:

“Suggested enhancements to the Healthcare Delivery Section :We strongly suggest an addition to the electronic medical record to specifically address preventive health prompts in electronic medical record system (so that providers can recommend screening or prevention counseling if they see one is missing at the time of the appointment).

Suggested addition to Governance and Operations section: We suggest that NC Prevention Partners (NCP) be added as a valuable organization to the governance team. NCP is an award winning, mature nonprofit that is recognized for excellence in leadership, conducting business in an open and transparent manner, and representing key stakeholders that support strengthening population and clinical prevention systems. NCP has expertise and tools in population health and prevention, and in clinical prevention.”

Sharon Conrad, Member of the public:

“Sounds very good. I just hope that whatever technology system is designed that it will “talk” to the technology systems across the nation should something happen and we be out of NC.”

James W. Carter, MD, Chief Medical Officer, East Carolina Health:

“Medicine is delivered locally and regionally. Each provider is at a different place and has adopted different means to utilize records. The availability of each patient’s entire medical record is one of the mainstays to the quality of the Mayo Clinic and they cite daily breakthroughs in patient care for this reason. In line with this observation, every effort should be made to provide the entire record to providers. Where legacy systems are in place and do not communicate with each other different options will be necessary in terms of information exchanges. Based on the medicaid models and networks a regional plan will provide an optimal method of developing EMR that meets the needs of the patients.”

Note: All comments received during the public comment period will be included with the final report and forwarded to the NC Office of Economic Recovery and Investment.