



Kentucky e-Health Network
A Case for Designing the Nation's Model

Presented to
Senator Mitch McConnell

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Executive Summary

Kentucky proposes to use the entire state as a laboratory to build a national model as a prototype of Next Generation Healthcare. This prototype will serve as a foundation upon which the nation can respond to the Institute of Medicine's (2001) urge to bridge the gulf between care as it is and care as it can and should be.

The only thing on the horizon to significantly reduce the cost of healthcare and at the same time significantly improve the quality of healthcare is health information technology (HIT). Believing that there would be a return on investment (ROI), the Bush Administration and the federal government has recommended that the National Health Information Network (NHIN) be implemented by 2014, and they have provided funding for limited pilot information technology projects, which are insufficient to prove this concept and ROI. The small improvements are not keeping up with the declining quality and increasing costs within the health care system. Decreasing cost and improving quality depends on a comprehensive Next Generation Healthcare model that no one has produced. The research of such a model is imperative to drive the investment and change desperately needed in this country. The changes will come from the states.

Of all states, Kentucky is unique. The Commonwealth has the full complement of assets needed to implement an innovative model and to conduct the evidence based research that will drive changes in healthcare. First, Kentucky has a governing infrastructure already in place with the e-Health Network Board and Healthcare Infrastructure Authority, which includes the University of Kentucky and the University of Louisville as the research component. This infrastructure was created in Senate Bill 2 of the 2005 Regular Session of the Kentucky General Assembly, co-sponsored by President David Williams and at that time Senator Daniel Mongiardo. In addition, the Kentucky e-Health Corporation was created and is filing for 501 (c)(3) designation to foster public and private investments. Second, Kentucky has a very limited and very manageable number of healthcare stakeholders. There are only two major insurance companies to work with to redesign the next generation reimbursement models to drive the new system.

The promise of the improving the lives and health of Kentuckians is the driving force to develop a statewide health information network. Kentucky has one of the sickest populations in the nation, ranking 45th nationally on health outcomes. Typically, research is done on sick individuals. Kentucky's poor health status makes it a perfect laboratory to study the impact on health status and the ROI related to an e-health information.

The Lieutenant Governor and the e-health information leaders of Kentucky plan to raise \$500 million to capitalize the model, fund the research, brand, and market the model. The redesigned reimbursement model will provide ongoing operational costs.

It is envisioned that the network will provide a utility that can be used to implement a wide range of applications. The network will permit the exchange of data among providers with the consent of the patient. It will include decision support tools, disease

management tools, biosurveillance and population health features; and will support the predictive modeling for preventive health based on the patient's genetic information as the human genome markers for specific diseases becomes available.

The end result will allow a patient and a physician to be in an exam room with that patient's information including all medical information along with medical decision support tools, alerts, and research from the nation's best universities on how to treat that specific individual patient. This Next Generation model will allow a physician in Hyden, Kentucky to provide the same care as a physician with the Mayo Clinic. This approach will eliminate redundancy, prevent medical errors, and speed correct decisions to all patients while providing a biosurveillance, bioterrorism defense, and prevention/wellness system. The universities will research the ROI and determine the significant improvements in disease conditions.

This Next Generation model will revolutionize healthcare! Moving the country to Next Generation Healthcare will be a challenge and quite possibly one of the most difficult tasks this country has ever undertaken. The economy of the state will likely be transformed by attracting hi-tech companies, jobs and investments. Since moving the healthcare industry from paper to digital is going to be one of the largest markets this country has ever seen, many technology companies have made HIT their number one initiative.

Kentucky e-Health A Case for Designing the Nation's Model

Kentucky proposes to use the entire state as a laboratory to build a national model as a prototype of Next Generation Healthcare. This prototype will serve as a foundation upon which the nation can respond to the Institute of Medicine's (2001) urge to bridge the gulf between care as it is and care as it can and should be. In its report, *To Err is Human*, the Institute of Medicine, reported that paper records contribute to 44,000 to 98,000 American deaths each year. In addition more than 7,000 Americans die every year from preventable medication errors. The Institute urged the nation to transform health care delivery in this county (IOM, 2000).

The American people are concerned about the rising cost and mediocre quality of health care. Newt Gingrich proposed a "21st Century Intelligent Health System" (Merritt, 2007). Although the United States spends more of its gross domestic product on health care, the United States continues to lag behind most industrialized nations in health outcomes. The United States spends over \$2 trillion on health care, roughly about 16 percent of its gross domestic product (GDP). The United States spends almost twice as much as the next leading industrialized nation, putting the United States at a severe economic disadvantage in a global economy. At the current rate of growth, by 2014, nearly 20 percent of the United States GDP will be spent on health care. As health care spending has grown, so have the premiums for health insurance, leading to an increased number of uninsured. Increased insurance premiums also affect employers' ability to continue to offer health insurance and compete in the global marketplace.

If the increase in expenditures resulted in better outcomes, longer life expectancy, and improved quality of life, then the investment may be well justified. However, as the United States leads in spending, it ranks 37th in overall health care performance and 22nd in life expectancy compared to other industrialized nations (WHO, 2007).

In his introduction to *Paper Kills*, Newt Gingrich, founder of the Center for Health Transformation, encouraged fundamental changes from today's approach to health care (Merritt, 2007). These changes included putting the patient at the center of the health care system. He described the future healthcare system as providing all Americans with access to the care they need and the ability to pay for it. Empowering Americans to make responsible, informed decisions about their health care and early health, prevention, and wellness are basic values that are essential to build the Next Generation of Healthcare, which includes an intelligent health system that supports health care providers in delivering health care based on the latest research and in the most efficient and effective manner.

Perfecting the use of health information technology is a proven strategy that transforms health care by significantly improving the quality of health care and significantly decreases the cost of health care. The value of electronic health information was demonstrated by the University of Kentucky Center for Rural Health (2001). In a sample of 10,000 uninsured patients, the center demonstrated a cost saving of 60 percent,

primarily related to decreased emergency room visits, hospitalizations, and the elimination of unnecessary, redundant tests. This demonstration program used lay health navigators to help medically underserved clients access health care and social services. An interactive information network provided real time electronic health information and tracking of the client's use of health and social services. Lay health navigators helped clients to adhere to their medical plan of care. Furthermore, the Executive Director and associates at the Center for Information Technology Leadership established a business case for spending money on a fully standardized nationwide system. In their cost-benefit model, this group reported a net value of \$77.8 billion per year once a national network is fully implemented (Walker, et al., 2005).

Kentucky is well positioned to become the national leader in developing the Next Generation Healthcare delivery system and become the corridor of health care in the United States. It is envisioned that this system would be paperless. Providers would exchange data electronically and patients would have access to their health information anywhere in the world. The network would include decision support tools, disease management tools, biosurveillance capabilities, and population health features. The network would support the building of personal health records. Ultimately, predictive modeling could be used for preventive health based on the patient's genetic information as the human genome markers for specific diseases become available. The testing of the model for the National Health Information Network and proving, through research, the impact on the health outcomes and the return on investment (ROI) of information technology would result in huge economic benefits for the state. It is anticipated that a mirror program will be demonstrated simultaneously in Rhode Island.

Kentucky's Strong Bipartisan Leadership and Support

Trust and confidence in the governing structure is critical to the success of an e-health network. Kentucky's landmark legislation, Senate Bill 2 of the 2005 Regular Session of the Kentucky General Assembly, set Kentucky ahead of all states with the creation of the first statewide infrastructure that ensures confidence among stakeholders, including physicians, payors, purchasers, and consumers of health care.

This landmark legislation was made possible through the bipartisan work of both chambers of the Kentucky General Assembly. It created two structures—the Kentucky e-Health Network Board and the Kentucky Healthcare Infrastructure Authority, which brings the two major research universities together to serve as a forum for the incubation and exchange of ideas and as a research arm for the board. In addition, the e-Health Network Board created a nonprofit corporation to accept public and private funds and implement e-health statewide. The board is co-chaired by the Presidents of the University of Kentucky and the University of Louisville. The Healthcare Infrastructure Authority and the e-Health Corporation are co-chaired by faculty from the two universities. The state will look to the universities and to help build a comprehensive business plan and architecture for the network.

Kentucky is looking to its leader in the United States Senate to shepherd the development of bipartisan support to obtain federal funds to build a comprehensive statewide e-health in Kentucky and Rhode Island. The network will include a full complement of services including, data sharing, disease management, decision support, biosurveillance, population health, and predictive modeling for preventive health. Kentucky would serve as the laboratory for the proof of concept of sharing health information in real time, in a fully interoperable system. The Kentucky model would demonstrate the ROI, as well as the impact on the cost and quality of health care. Several other United States Senators have committed to working with Kentucky's leadership in the Senate to support a national model in Kentucky, with a similar all-inclusive state program in Rhode Island.

On the state level, Kentucky stakeholders are excited about the possibility of Kentucky becoming the national model for health information exchange. Kentucky's Lieutenant Governor has met with various stakeholders including the Presidents and faculty from a wide range of disciplines at the University of Kentucky and the University of Louisville. Members of the United States House of Representatives have offered their support including Representatives Ed Whitfield and Hal Rogers. Other groups that have expressed full support include the Kentucky Medical Association, representing 7,000 members, and the Kentucky Hospital Association, representing 126 hospitals, the Center for Health Transformation, and numerous national and global industry leaders in health information technology. In addition, the Kentucky Lieutenant Governor has spoken with the administration of many of the hospitals in Kentucky, which has generated a great deal of excitement about the proposed Next Generation Healthcare.

Kentucky – The Perfect Place to Build a National e-Health Model

Kentucky has one of the sickest populations in the nation, ranking 45th nationally on health outcomes. Kentucky has the highest prevalence of smoking and adolescent obesity in the nation; and Kentucky has a high rate of cancer death with 223.7 deaths per 100,000 population yearly. Kentucky has a high rate of preventable hospitalizations with 113 discharges per 1,000 Medicare enrollees (United Health Foundation, 2007). Kentucky also ranks among the top six states with the highest prevalence of chronic disease, including cancer, cardiovascular disease, diabetes, chronic lower respiratory disease, and obesity (Commonwealth of Kentucky, 2008).

Typically, research is done on sick individuals. Kentucky's poor health status makes it a perfect laboratory to study the impact on health status and the ROI related to an e-health information network. In addition, Kentucky only has three major payors, Anthem, Humana, and the state Medicaid program. Anthem, with 60 percent of insured lives in Kentucky, Humana, a Kentucky based company, and Medicaid, constitute nearly all insured citizens in Kentucky, except for Medicare. Anthem and Humana have already agreed to be partners in designing this model.

Kentucky is one of the most wired states with broadband. Kentucky has completed a comprehensive request for information process which provided insight and understanding

regarding technologies currently available, as well as what is on the horizon. A list of selected characteristics that make Kentucky the perfect state to implement a national e-health network include:

- Bipartisan leadership;
- Right size state located in the heart of America – diverse geography, history, and culture;
- Large Medicaid population – over 700,000 beneficiaries;
- Two major insurance companies – Anthem and Humana;
- Digitally advanced state – most wired – Connect Kentucky and Kentucky Information Highway;
- Fort Knox – existing security infrastructure;
- Kentucky Medicaid Management Information System – a nation leader;
- Among the top 10 most digitally advanced state governments;
- Statewide TeleHealth Network – a national model;
- Kentucky All Schedule Prescription Electronic Reporting (KASPER – national model for monitoring controlled substance use;
- Capacity for storing large systems underground;
- Won a national award from the American Council of Technology for its web based system called KY CHILD;
- Preparedness and Response on Advanced Communication Technologies – national model for disaster preparedness and education;
- Kentucky Health Alert – wireless network for preparedness and response to disasters;
- Leaders in public health informatics; and
- Two major universities prepared to be the research the ROI and improved disease conditions.

KY Plan – Components of the Model

The healthcare industry invests approximately 2 percent of revenues on information technology per year, in comparison to the banking industry which invests 15 percent. Healthcare is a much more information intensive industry. The reason is that there are limited funds in healthcare, and there is no research based proof that a comprehensive model using information technology will generate an ROI. All information related to a ROI for health information technology at this point is essentially only unproven theory.

The limited availability of funding for e-health has resulted in states piloting limited components of an e-health, such as e-prescribing or administrative transactions. These diverse projects do not allow for the testing of a unified full functioning system and make it impossible to demonstrate the ROI, which is critical for widespread adoption and investment by providers. This will be branded and marketing will be used to promote widespread adoption and trust among providers and consumers of health care.

Kentucky proposes to develop a robust statewide Next Generation Healthcare model, providing a full array of applications including clinical and administrative applications and tools to improve health and wellness to consumers and communities.

The system would include a statewide network over which health care information can be shared with other providers in a secure manner. Information would be shared with other providers with the consent of the patient. This system would be built to interface with existing software and hardware currently used by Kentucky providers. The network would be much like a major highway upon which all types of applications could be pushed to the health care provider. For example, a list of prescription medications and clinic research findings for the particular diagnosis of the patient could be pushed over the network. In addition, selected information can be pushed from the provider to a specialist upon referral. Providers could retrieve information on the lab results and diagnostic exams such as x-rays that their patient received in the emergency room or urgent treatment center, thus, preventing the repeat of these diagnostic tests and procedures.

The patient may also use “wired” or “wireless” devices at home to continue to monitor his or her disease state from home and transmit data to their medical provider’s office to prevent complications before they happen. For example, a wireless glucometer can be used to check a diabetic’s blood sugar levels at home. The glucometer would be connected to the provider’s office and abnormal levels would alert providers thus preventing expensive hospitalizations and emergency room visits.

The network would be used to share data for biosurveillance. Intelligent software currently exists and could be used over the network for mining of data to identify an array of symptoms that would indicate the potential exposure to a biological agent typically used in terrorism. Also, data required for public health surveillance of disease could be pushed by the provider to public health departments. This would cut down on costly faxes and paper systems and vastly improve the sensitivity and speed detection of disease. Public health situational awareness could be real time.

The real value to the health care provider is that a well designed connected network will improve the quality of patient care and speed the workflow of the provider’s practice. The networked applications would be designed for the providers to access all pertinent information from one screen or their electronic medical record system. Current systems are not well integrated and require navigating several portals and internet searches, which providers do not have time to do during a patient visit.

One of the most important components of Kentucky’s Next Generation Healthcare model would provide tools that would provide the latest treatment recommendations to assist providers in making clinical decisions for their patients that are based on latest research. Providers will be made aware of potential drug-drug interactions thereby preventing adverse reactions to treatment. This would enable care provided in the most remote part of Kentucky to be equivalent or better than the care provided by world renowned clinics. The amount of research published each year is so vast that it is estimated that a physician

would have to read over 20 articles a day everyday in order to keep abreast of the latest clinical research. This provides insight into why it takes approximately 17 years for research to be translated in every day clinical practice.

Imagine being able to obtain a predictive health care profile from which to design a customized healthcare and wellness plan designed specifically for the individual based on his or her genetic code rather than the getting health screenings based on one's age (Weston & Hood, 2004). This Next Generation Healthcare is possible in the near future with the support of e-health information tools. This approach would improve longevity and quality of life, while decreasing the costs of unnecessary tests and preventing chronic disease. Information technology will serve as the foundation upon which all facets of the health care system can be improved. A pyramid of the layers of the network, with the governance at the foundation and the use of human genome research to implement prevention as the pinnacle is presented in Figure 1.

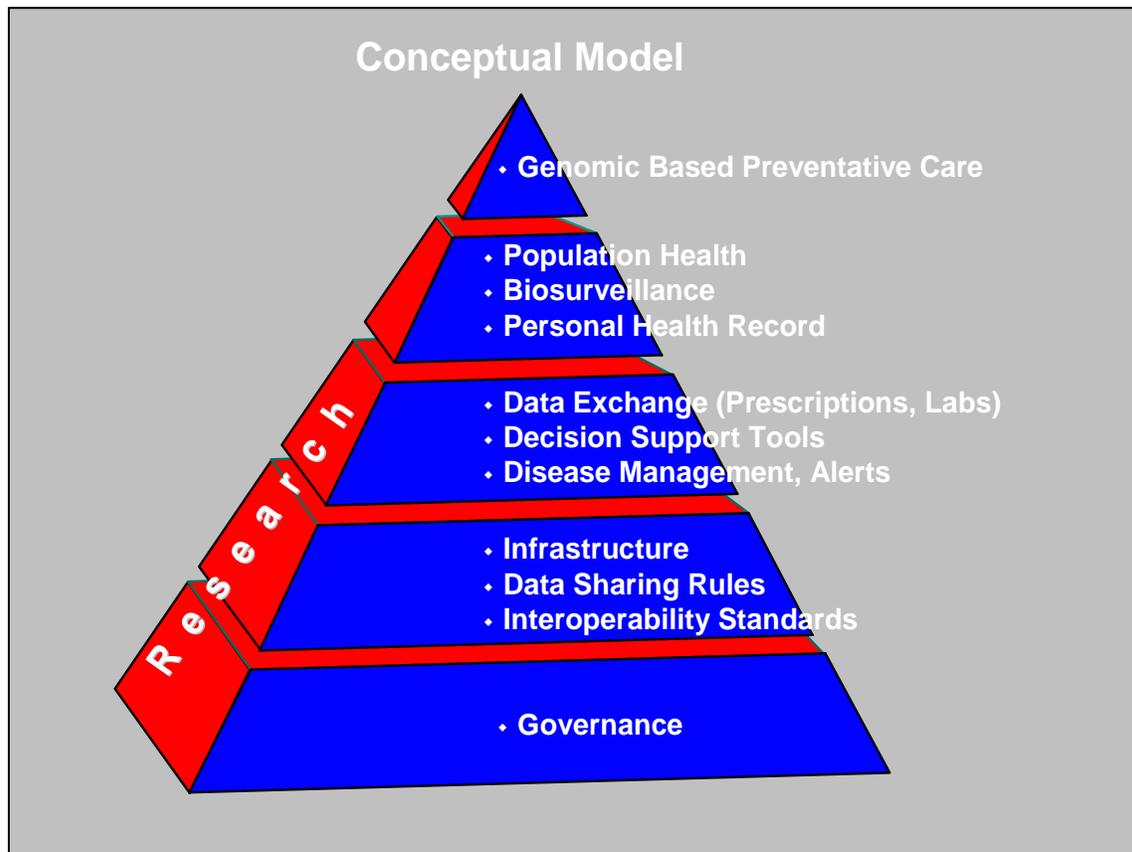


Figure 1.

Economic Impact

The economic impact of an e-health network would be unlimited. It is anticipated that a network would decrease insurance premiums, benefiting large purchasers of health care. The research by the Kentucky universities would have a synergistic effect in bringing

other large pharmaceutical research laboratories to Kentucky. Opportunities for the development of new software companies, as well as storage of health information would spin off from the network and research initiatives.

Funding for the Model

Funding is a major challenge in developing a statewide e-health network. The cost to roll out a national health information network was estimated to be \$156 billion over a five year period (Kaushal, et al., 2005). Based on that estimate, the cost for a statewide network in Kentucky could be as great as \$1.5 billion over a five year period, calculating Kentucky's proportion of the cost based on population. The cost could be less in Kentucky due to a decrease in the cost of hardware and communications over time and already ongoing investment in the existing communication systems and healthcare investment in information technology.

In order to bring this vision to fruition, Kentucky plans to seek funding from a variety of sources. Initially, Kentucky requests an initial block of funding through a line item in the federal budget in the amount of \$250 million. These funds would be used to leverage private funding. Kentucky is exploring funding opportunities with the Robert Wood Johnson Foundation, Gates Foundation, WellPoint, and many other stakeholders and large corporations that will most benefit from improved care, as well as in-kind contributions.

Funds would be used to develop the necessary governance to maintain trust and confidence among the stakeholders and to build the network, interfaces to integrate current systems with laboratories, pharmacies, hospitals, health care provider offices, and components of the network to support clinical decisions, disease management, biosurveillance, and public health reporting. Matching funds would be made available to assist providers to adopt and expand information technology including electronic medical records and to build interfaces between their existing software and other sources of critical information. In addition, funds would support storage of de-identified health information with the patient's consent for research studies, and funds will be provided to the universities to comprehensively research the model of Next Generation Healthcare.

Conclusion

Information technology is the foundation to transforming health care to a system focused on health and wellness — one that meets the challenge of bridging the gulf between the current health care and what can and should be. Kentucky proposes to build a statewide comprehensive network to prove the concept of timely sharing of health information over a fully interoperable network. Kentucky has a sick population where the ROI can be demonstrated. The outcome is expected to encourage Kentuckians, and eventually all Americans, to be more active in their health care, leading to longer and healthier lives while at the same time reducing the cost of healthcare. This would increase the number of people who can afford health care and eliminate the cost gap with other countries to improve our global competitiveness.

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