ASET
Arizona Strategic Enterprise Technology

Arizona Health Information Exchange (HIE)
Unconnected Providers Program

ARIZONA HIE ENVIRONMENTAL SCAN
RURAL HEALTH CARE

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During the fall of 2012, the Arizona Strategic Enterprise Technology (ASET) Office commissioned a series of interviews and an HIE environmental scan to better understand the adoption and use of health information technology, and health information exchange, in Arizona.

The HIE environmental scans of the three specific healthcare segments: Behavioral Health Care, Long Term Care, and Rural Health Care, covered activities associated with the federal government, at the national level, within Arizona, and within other states. The scans reviewed publicly available resources.

The interviews were conducted during August and September of 2012 with 32 individuals representing 19 organizations. These organizations were chosen to provide representative views of Behavioral, Long Term Care, and Rural providers and to elicit information concerning their adoption and use of health information technology and exchange in Arizona. An Arizona HIE environmental scan is included to provide perspective.

This report addresses the Rural Health Care environment.

All of the reports can be downloaded from the ASET website at
http://hie.az.gov/it.htm

Arizona HIE Environmental Scan and Community Interviews
HIE Environmental Scan – Behavioral Health Care
HIE Environmental Scan – Long Term Care
HIE Environmental Scan – Rural Health Care

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Background

Arizona has a rich history of promoting health information technology (HIT) and health information exchange (HIE). In 2006, community leaders came together and developed the Arizona Health-e Connection Roadmap. The Roadmap identified the priorities for healthcare network services and created a business plan that focused on meeting the needs of health care providers, payers, patients, consumers, and employers.

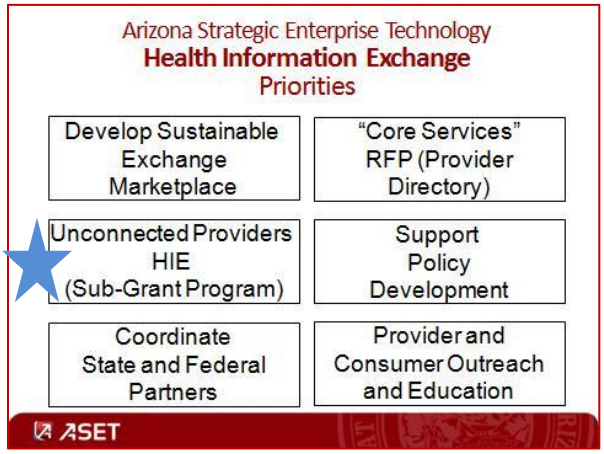
In 2009, Congress passed the American Recovery and Reinvestment Act (ARRA). A key piece of this legislation was the Health Information Technology for Economic and Clinical Health (HITECH) Act. This Act established Meaningful Use (MU) of interoperable EHRs in the health care system as a critical national goal and it incentivized EHR adoption by providers.[1] Health information exchange (HIE) has emerged as a core capability required for both hospitals and providers to achieve MU, qualify for the incentive programs, and provide better care for patients.

Another key element of the HITECH Act was the State Health Information Exchange Cooperative Agreement Program (SHIECAP). This program assists states and territories to advance regional and state level HIE; while moving toward national interoperability of patient health information.[2]

In March 2010, the State of Arizona was awarded a $9.3M SHIECAP grant. The Grant is provided as a catalyst to develop the necessary infrastructure for Arizona's health information exchange capability. The Arizona Strategic Enterprise Technology (ASET) office is responsible for the programmatic implementation of this grant for the State of Arizona.[3]

In responding to the grant award, ASET formed an HIE Steering Committee to continue the momentum of the work done in 2006 which created Arizona's Health-e Connection Roadmap. The Committee continued to leverage community resources and relationships, establish priorities for the grant funds, and provide on-going review and feedback of the grant program.

In the fall of 2012, ASET launched the ***Unconnected Providers' Grant Program***[4] to support HIE planning and implementation for health care organizations. This grant program is aimed at stimulating the adoption of HIE by healthcare providers who currently have not planned or implemented an information exchange solution. It has a special focus on rural hospitals and providers, behavioral health providers, and long term care providers. To help prepare for this grant program, ASET commissioned an environmental scan of current health information exchange initiatives in Arizona and around the country and interviews with Arizona healthcare providers.



Introduction

Seventy-two million Americans, roughly 23% of the population, live in rural areas.[5] Rural America is characterized by sparse populations distributed across wide geographic regions. Rural residents tend to be older, have lower incomes and are more likely to be uninsured[6] than residents of metropolitan areas. Rural Americans also are more likely to suffer from chronic illnesses than their urban and suburban counterparts. Nearly half of rural residents report having at least one major chronic illness, and chronic diseases such as hypertension, cancer, and chronic bronchitis are up to 1.4 times more prevalent in rural than in large urban areas.[7]

Healthcare in rural America suffers from a shortage of primary care providers, specialists, and tertiary care hospitals, limited technology infrastructures and even more limited financial resources. Rural patients are often required to travel long distances for advanced medical care.

There are identifiable medical trading areas where local care providers frequently send their patients who have complex health issues. Receiving a more intense evaluation and treatment is beneficial to the patient, yet rural providers are often frustrated at the lack of communication back to them once a patient has been seen by a specialist or discharged from a hospital. Improved transitions of care communication is seen by rural providers as critical to improving care – something HIE could readily provide.

However, for rural communities, some of the very characteristics that contribute to the disparities in care that health information exchange (HIE) can help overcome, also present the greatest obstacles to organizing the initiatives that make HIE possible.[8]

Rural hospitals generally have slimmer operating margins due in part to the small number of inpatient beds and the level of fixed operating costs necessary to maintain a quality institution. Due to the small number of inpatient days, there is less opportunity to spread these costs. These rural hospitals, already operating on very thin margins, are expecting an erosion of income in the next few years due in part to an expansion of patients covered under Medicaid.

In addition to the slim operating margins rural hospitals experience, many are standalone institutions and not affiliated with major health care systems. Similarly, many rural providers are in small or solo practices. These are some of the factors that contribute to the overall reluctance of rural providers to invest in the high costs of technology.

Summary of Findings

Potential Barriers and Challenges for Rural Health Information Exchange

While each rural community is unique, there are some commonalities as well – especially in the area of HIE connection. Listed below are some of the barriers and challenges that are unique to or amplified in, the rural healthcare environment as they consider participating in health information exchange.

Lack of resources

Rural healthcare communities generally lack the financial and technical resources that are required for participation in HIE. Recruiting and retaining a skilled technology workforce – especially those trained in health information technology – is more difficult in rural areas due, in part, to the reluctance of technical people to move to the more rural areas. This lack of a technical workforce is exacerbated by the limited financial resources facing most rural health care providers.

Geographic dispersion

Rural communities are generally characterized by sparse populations in broad geographic areas. This population dispersion leads to other issues such as limited infrastructure – such as high speed internet connection – that is necessary for HIE.

Population demographics

Rural populations tend to, on average, be of a lower socioeconomic status than the population as a whole. There is a prevalence of small and independent provider practices. This limits the opportunity for leveraging the costs of technology through economies of scale. Rural patient populations have a high rate of patient transfers out of the area.

Opportunities to Consider

The unique characteristics of health care in rural areas continue to call for specific targeted actions to support the adoption and use of HIE. The following opportunities for promoting and supporting HIE in rural areas are presented for consideration.

Leverage multiple state and federal rural-focused programs

There are many programs at the state and federal level focused on improving health care in the rural areas. There is significant opportunity to leverage these programs by ensuring that rural providers are aware of the programs and have the opportunity to work with each other to develop synergies among the programs. Because of the long geographic distances, rural providers would benefit from continued focus on coordination of efforts for grant funding and building on work done to date.

Develop key partnerships

There is significant opportunity for improving health care when patients are transferred between their home region and a more urban setting. Working with rural providers to help them identify key trading partners not only within their community, but also those outside of their region will provide a focus for HIE efforts.

Provide resources

Rural providers operate on very slim margins. There is an opportunity to help them participate in HIE by assisting with some of the basic costs incurred such as EMR installation, HIE interface development, HIE connection fees, supplements for broadband access, and shared technology resources.

Include rural providers

While rural providers may be geographically separated from their urban counterparts, they nevertheless want to be a part of the process for HIE development. There are many opportunities to educate rural providers on the activities surrounding HIE. In addition, rural providers should be represented on state or other HIE decision making bodies with whom they participate.

Environmental Scan: Federal and National

Federal Initiatives

There are many federal programs designed to specifically address the rural health care market.

Federal Designations

Critical Access Hospital Designation

A critical access hospital (CAH) is an organization certified to receive cost-based reimbursement from Medicare.[9] The reimbursement that CAHs receive is intended to improve their financial performance and therefore, reduce hospital closures. CAHs are certified under a different set of Medicare Conditions of Participation (CoP) that are more flexible than the acute care hospital CoPs.

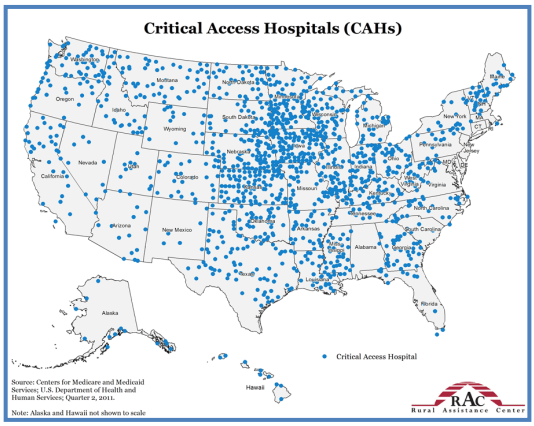


Figure 1: Critical Access Hospitals in US

To be designated a CAH, a rural hospital must meet defined criteria that were outlined in the Conditions of Participation 42CFR485 and subsequent legislative refinements. Among the requirements for CAH designation are:[10]

- Be located in a State that has established a State rural health plan for the State Flex Program;
- Furnish 24-hour emergency care services 7 days a week;
- Provide no more than 25 inpatient beds that can be used for either inpatient or swing bed services;
- Have an average annual length of stay of 96 hours or less per patient for acute care; and
- Be located either more than a 35-mile drive from the nearest hospital or CAH or more than a 15-mile drive in areas with mountainous terrain or only secondary roads

As of March 2011, there were 1,327 certified CAHs throughout the United States.[11] According to the Rural Assistance Center[12] there are 14 critical access hospitals in Arizona.

Federally Qualified Health Centers

Federally Qualified Health Centers (FQHCs) provide comprehensive health care services to underserved communities. The FQHC benefit under Medicare[13] was added in 1991 by an amendment of the Social Security Act.

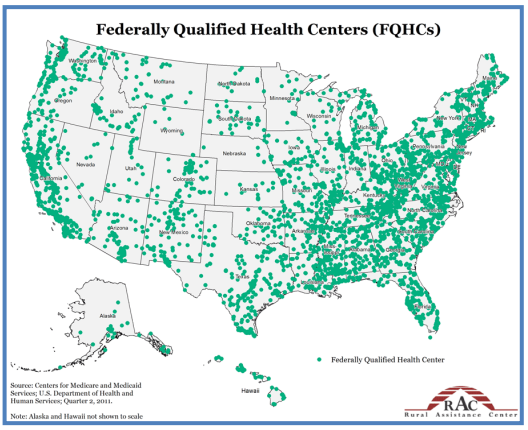


Figure 2: Federally Qualified Health Centers in the US

FQHCs are "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. The main purpose of the FQHC Program is to enhance the provision of primary care services in underserved urban and rural communities.

As of 2010, there are 1,124 FQHCs in the US.[14] According to the Rural Assistance Center[15] there are 16 Federally Qualified Health Centers providing services at 118 sites in Arizona.

Rural Health Clinics

A Rural Health Clinic[16] (RHC) is a clinic certified to receive special Medicare and Medicaid reimbursement and must be located in a rural area that is either a HPSA or a MUA/P. Rural Health Clinics (RHCs) were authorized in 1977 to improve access to care and to increase the utilization of non-physician practitioners such as nurse practitioners (NP) and physician assistants (PA) in rural areas.

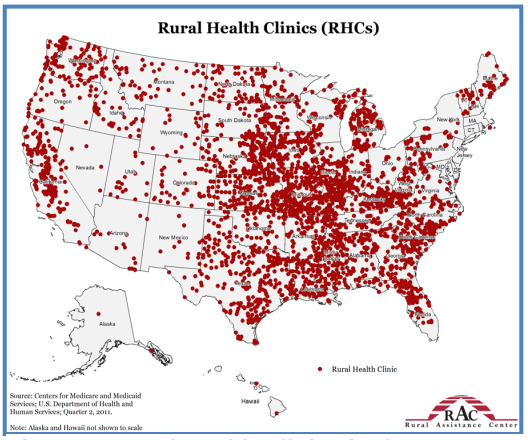


Figure 3: Rural Health Clinics in the US

RHCs are required to use a team approach consisting of physicians and midlevel practitioners such as nurse practitioners, physician assistants, and certified nurse midwives to provide services. The clinic must be staffed at least 50% of the time with a midlevel practitioner. RHCs are required to provide out-patient primary care services and basic laboratory services.[17]

There are approximately 3,800 RHCs nationwide that provide access to primary care services in rural areas. Arizona has[18] 17 rural health clinics.

Federal Program Examples

CMS Meaningful Use Incentive Program

The Medicare and Medicaid EHR Incentive Programs[19] provide incentive payments to eligible professionals, eligible hospitals, and critical access hospitals (CAHs) as they adopt, implement, upgrade, or demonstrate meaningful use of certified EHR technology. Eligible professionals can receive up to $44,000 through the Medicare EHR Incentive Program and up to $63,750 through the Medicaid EHR Incentive Program.

Medicare Rural Hospital Flexibility (Flex) Program

The Flex[20] program provides funding to state governments to spur quality and performance improvement activities, stabilize rural hospital finance, and integrate emergency medical services (EMS) into their health care systems. Only States with CAHs or potential CAHs are eligible for the Flex program.

Flex funding encourages the development of cooperative systems of care in rural areas – joining together CAHs, EMS providers, clinics, and health practitioners to increase efficiencies and quality of care.

The Flex program focuses on four core areas:

1. Support for Quality Improvement in CAHs
2. Support for Operational and Financial Improvement in CAHs
3. Support for Health System Development and Community Engagement, including integrating EMS in regional and local systems of care
4. Designation of CAHs in the State

The Flex program operates on the National, State, community, and facility levels to cover a broad range of fundamental health service issues and “modernization” goals. States use Flex resources for performance management activities, training programs, needs assessments, and network building.

Arizona actively participates in the Flex Program. Among its key achievements is the annual state appropriation of $1.7M to support its 10 non-Indian Health Services CAHs.[21]

ONC HIT Regional Extension Centers

The HIT Regional Extension Centers (RECs) support and serve eligible health care providers to help them quickly become meaningful users of electronic health records (EHRs). RECs are designed to ensure that primary care providers obtain the help they need to use EHRs. As required by ARRA, small and independent practices are a key focus for REC assistance.

There are 62 federally funded and designated RECs nationwide. In 2010, the Arizona Health eConnection (AzHeC) was awarded a grant to become the REC assisting Arizona health care providers with EHRs and Meaningful Use.

Rural Assistance Center

A service of the U.S. Department of Health and Human Services' Rural Initiative, the Rural Assistance Center (RAC)[22] was established in December 2002 as a rural health and human services "information portal." RAC helps rural communities and other rural stakeholders access the full range of available programs, funding, and research that can help them provide quality health and human services to rural residents.

Rural Health IT Adoption Toolbox

The Rural Health IT Adoption Toolbox[23] was developed by the Office of Rural Health Policy (ORHP) in the Health Resources Services Administration (HRSA). This resource is targeted towards rural health providers that are seeking to implement health IT to improve the overall effectiveness of their institutions.

Federal Grants Examples

Flex CAH Health IT Grant

In the fall of 2007**,** the U.S. Department of Health and Human Services, Health Resources, and Services Administration (HRSA), Office of Rural Health Policy (ORHP) utilized $25 million in one-time funding to support 16 rural grantees to develop and implement HIT pilot networks in an 18-month time frame. OHRP funded grantees through its Medicare Rural Hospital Flexibility (Flex) Critical Access Hospital (CAH) Health Information Technology (HIT) Network Implementation Program,[24] which promotes the implementation of HIT in CAHs and their associated network of providers in States that are current Medicare Flex grantees. The grantees were charged with designing, creating, and implementing functional pilot networks to improve coordination of care in their communities, and provide lessons learned for future providers and networks in adopting HIT.[25] Additional information on related individual state initiatives can be found in the "States" section of this paper.

In Arizona, the University of Arizona, Arizona Rural Health Office (RHO) has received funding for the Arizona Rural Hospital Flexibility Program (AZ-Flex) for many years[26]. Since 2010, the Arizona RHO has received over $1.5m in Flex grant funding. AZ-Flex provides technical services to 14 CAHs, four potential CAHs, other rural hospitals, 13 RHCs, and a statewide network of emergency medical service providers.

USDA Broadband Grant

In May of 2012 the USDA announced its Community Connect grants program. The Community Connect program serves rural communities where broadband service is least likely to be available, but where it can make a tremendous difference in the quality of life for citizens. The projects funded by these grants will help rural residents tap into the enormous potential of the Internet.[27]

Arizona has been the recipient of tens of millions of dollars to expand broadband access to rural communities.

Federal Designations

Health Professional Shortage Area

Health Professional Shortage Areas (HPSAs) are designated by the U.S. Health Resources and Services Administration (HRSA) as having shortages of primary medical care, dental or mental health providers and may be geographic (a county or service area), demographic (low income population) or institutional (comprehensive health center, federally qualified health center or other public facility).

Nationwide, there are:[28]

- 5,721 Primary Care HPSAs with 54.4 million people living in them.
- 4,406 Dental HPSAs with 43.8 million people living in them.
- 3,689 Mental Health HPSAs with 87.1 million people living in them.

Arizona has 671 HPSAs. Every Arizona county has at least one HPSA.[29]

Medically Underserved Area/Populations (MUA/P)

Medically Underserved Areas/Populations are areas or populations designated by HRSA as having: too few primary care providers, high infant mortality, high poverty, and/or high elderly population.[30]

According to the HRSA website, Arizona has 270 MUS/Ps with every county in Arizona having some part of its area/population designated as Medically Underserved.[31]

National Initiatives

There are a variety of national level resources to assist rural healthcare providers. Below are examples of the resources available.

National Rural Health Association

The National Rural Health Association[32] (NRHA) is a national nonprofit membership organization with more than 20,000 members. The association's mission is to provide leadership on rural health issues.

National Rural Health Resource Center

The National Rural Health Resource Center[33] (The Center) is a nonprofit organization dedicated to sustaining and improving health care in rural communities. As the nation's leading technical assistance and knowledge center in rural health, The Center focuses on five core areas:

- Performance Improvement
- Health Information Technology
- Recruitment & Retention
- Community Health Assessments
- Networking

The National Rural Health Resource Center, in collaboration with Stratis Health, the College of St. Scholastica, the National Rural Health Association, and the Rural Assistance Center, provides rural health information technology (HIT) education, information, and technical assistance. As the national knowledge center on rural electronic health record adoption, The Center offers comprehensive services targeted at rural hospitals, rural health clinics and state and national HIT programs. The Center staffs the National Rural HIT Coalition, which since 2006 has been a leading voice on rural HIT issues. The Center's services are summarized below.

- Rural HIT Education
- Rural Technical Assistance in HIT Adoption
- Rural HIT Research and Management
- Rural HIT Tools and Resources
- Rural HIT Program Experience

National Rural HIT Coalition

The National Rural HIT Coalition[34] is a network of rural and HIT leaders from organizations at every level, working together to advance the implementation of HIT across rural America by:

- Enhancing the understanding of rural HIT issues, including workforce shortages and ways to address them
- Advocating for HIT applications and solutions relevant to rural facilities
- Helping to drive knowledge and information about rural HIT throughout the country.

Environmental Scan: Arizona Rural Health Care

Arizona covers 113,635 square miles, with a 2011 estimated population of 6,482,505 people – 682,431 living in rural Arizona. According to the Arizona Department of Health Services, there are 114 hospitals in Arizona – 39 of which are located outside Maricopa and Pima counties.[35] The state has 14 hospitals identified by the Flex Monitoring Team as Critical Access Hospitals. There are 17 Rural Health Clinics in Arizona, and 16 Federally Qualified Health Centers provide services at 118 sites in the state.[36] Listings of the Critical Access Hospitals, Rural Health Clinics, and Federally Qualified Health Centers can be found in the Appendix.

According to the USDA Economic Research Service, the average per-capita income for Arizonans in 2009 was $33,207, although rural per-capita income lagged at $27,504. Estimates in 2010 indicate a poverty rate of 22.6% exists in rural Arizona, compared to a 17.0% level in urban areas of the state. The 2010 American Community Survey (ACS) data reports that 18.9% of the rural population has not completed high school, compared to 14.6% of urban populations. The unemployment rate in rural Arizona is at 12.2%, while in urban Arizona it is at 9.2%.[37]

Arizona has the third largest American Indian population among all the states. The state's rural population is 15 percent American Indian, and more than half of Arizona's 15 counties include reservation lands within their borders[38].

As of the 2010 census there were 556,729 veterans residing in Arizona[39]. Veterans represent 10% of the Arizona population and 1 in 4 Arizona veterans live in rural communities.[40] The disproportionate representation among rural Americans serving in the military has created disproportionate care for our nation's veterans.[41] In Arizona, 15 percent of the veterans and military retirees live in rural communities – above the national average of 12.7 percent.[42]

Arizona Accountable Care Organizations (ACOs), Health Information Exchanges (HIEs), and Telemedicine Initiatives

Arizona has a rich history of promoting HIT and HIE. As a result of prior state and community efforts, there are many initiatives – taking various forms – currently underway to share health information electronically. The examples noted below are specific to rural health care.

The full report, ***Arizona HIE Environmental Scan and Community Interviews***, including, other ACO, HIE, and Telemedicine initiatives can be downloaded from http://hie.az.gov/it.htm

HIE Initiatives

There are limited HIE activities currently taking place, or under development, in the rural areas of the state.

Community Access Partnership of Arizona and Mexico (CAPAZ-MEX); Cross-Border Continuity of Care Record project[43]

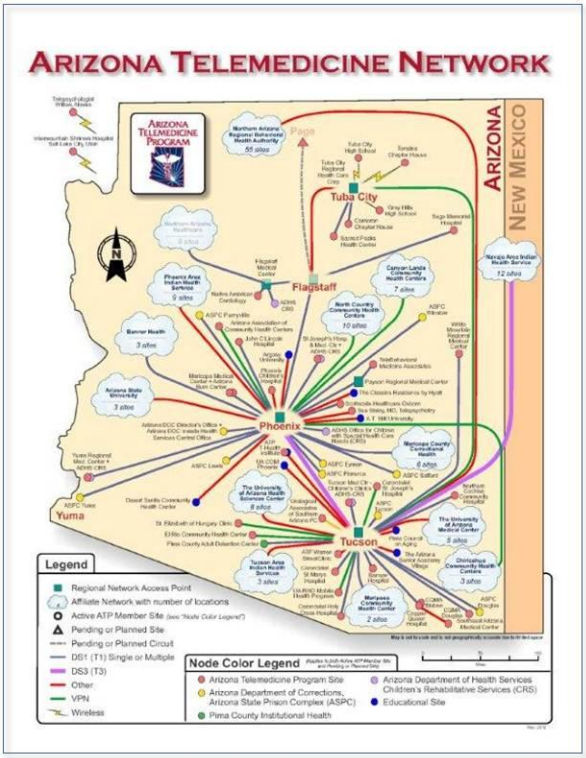
CAPAZ-MEX is a joint program between Mexico and Arizona whose primary goal is to improve the health status of the medically-underserved populations by building and strengthening the infrastructure for a continuum of care (medical, dental, and mental health). It is a private medical providers' discount network established by the Regional Center for Border Health, Inc[44] and the Yuma County Medical Collaborative to increase the availability, accessibility, and affordability of healthcare services for the uninsured and underinsured residents of Yuma County. The medical provider network extends to the US-Mexico border communities of San Luis R.C., Sonora, Los Algodones, and Mexicali, Baja California. Members can receive up to 65% discount on healthcare services. Members are enrolled into a Continuity of Care Record-Health Information Exchange (CCR-HIE) that allows their medical information to be accessed on both sides of the border by the CAPAZ-MEX medical providers through a secure web-portal.[45]

Yuma Regional Medical Center (RMC)[46]

Yuma RMC selected Epic Systems Corp for a $73.3 million, five-year initiative to implement inpatient and ambulatory electronic health records. The hospital's 2010-2014 initiative is linking interested community physicians to the hospital EHR. The consumer web portal was implemented in 2012.

Telemedicine Initiatives

There are many active telemedicine initiatives within the State. While telemedicine may not be specifically thought of as "health information exchange," there are numerous opportunities for working together with these programs to improve access to patient information.



The University of Arizona[47]

Arizona Telemedicine Program. Arizona has been a pioneer in telemedicine since 1995. The program has created partnerships among a wide variety of for-profit and not-for-profit healthcare organizations and has helped create new interagency relationships within the state government. The program demonstrates a strong commitment to research and currently provides medical services in twenty communities. Continuing medical education is delivered to thirty four communities using bi-directional video conferencing. The reach of this telemedicine program is depicted in the graphic.[48]

In 2004, through a grant from Blue Cross Blue Shield of Arizona, the University of Arizona was able to establish the Southern Arizona Telemedicine and Telepresence (SATT) Program. The program facilitates the virtual presence of an experienced trauma surgeon from the University of Arizona Medical Center, through a dedicated telemedicine network with five rural hospitals: Benson Hospital - Benson; Copper Queen Hospital - Bisbee; Southeast Medical Center - Douglas; Sierra Vista Regional Health Center - Sierra Vista; and Holy Cross Hospital - Nogales.

For more than ten years, the Arizona Telemedicine Program has operated pilot projects to test new tele-home health concepts. These projects utilize inexpensive videophone equipment connecting to the patient's home through ordinary telephone lines. The current use cases include: ostomy care, cardiac transplant care, and compassionate oncology care.

Mayo Clinic[49]

Mayo offers stroke telemedicine also called tele-stroke. Mayo doctors with advanced training in the nervous system remotely evaluate patients who have had acute strokes and make diagnoses and treatment recommendations to emergency medicine doctors at other sites. Mayo Clinic's hub in Phoenix serves patients in Bisbee, Casa Grande, Cottonwood, Flagstaff, Globe, Kingman, Parker, Show Low, and Yuma.

One recent study, in which Mayo Clinic - Phoenix participated, involved using telemedicine to diagnose concussions among rural-area high school students. The study involved doctors using telemedicine tools to evaluate and determine the concussion symptoms of a 15-year-old boy in Arizona.[50]

Carondelet Health Network[51]

Carondelet has a tele-cardiology program that expands the reach of rural hospitals. The rural hospital's emergency department physician can examine the patient and then initiate a tele-cardiology visit with a cardiologist at the urban hospital. The cardiologist helps the local physician decide whether to admit the patient or transfer to the urban center. The hospital's telemedicine program also includes tele-neurology, tele-stroke, and tele-education.

Copper Queen[52]

In 2007, Copper Queen Community Hospital (CQCH) installed Trauma Telemedicine technology. This provides emergency room doctors at the hospital a real-time video and audio connection with trauma doctors at University Medical Center in Tucson, who are then able to guide emergency room staff to facilitate patient stabilization prior to transfer.

In 2008, CQCH instituted tele-dermatology services and Coumadin clinics in the Rural Health Centers. Also in 2008, the hospital signed on with the Mayo Clinic in Phoenix to provide Stroke Telemedicine for Rural Residents (STARR). The STARR system provides physicians at the hospital with two-way, audiovisual communication with top neurologists throughout the state to treat acute stroke victims. The system allows for patients to be examined and stabilized prior to transport, if necessary; or to be treated locally without transport. CQCH has also implemented Electronic Medical Records, and uses telemonitors in patients' homes as part of their Copper Valley Home Health program.

In October, CQCH received a grant to purchase and install digitized x-ray systems in the hospital and its clinics. This will provide them the capability of sending images that may be read instantly in physician's homes or offices so that diagnoses may be made rapidly.

Southern Arizona VA Health Care System

The Southern Arizona VA Health Care System (SAVAHCS)[53] opened three Rural Health Coordination Care Centers (RHCCC). This expanded rural health care services to eligible Veterans in southern Arizona. The Casa Grande and Sierra Vista Centers are in separate facilities near the Community Based Outpatient Clinics (CBOC) and opened in the spring of 2012. The Yuma RHCCC was imbedded in the new, expanded Yuma CBOC that opened October 1st, 2012.

Each RHCCC and all CBOCs now have expanded Veterans' access to specialists, health education, and disease management support without leaving their 'home' clinic by using telemedicine capabilities which allows the Veteran to 'see' care providers or educators via live video teleconferencing from the SAVAHCS main campus or another CBOC.

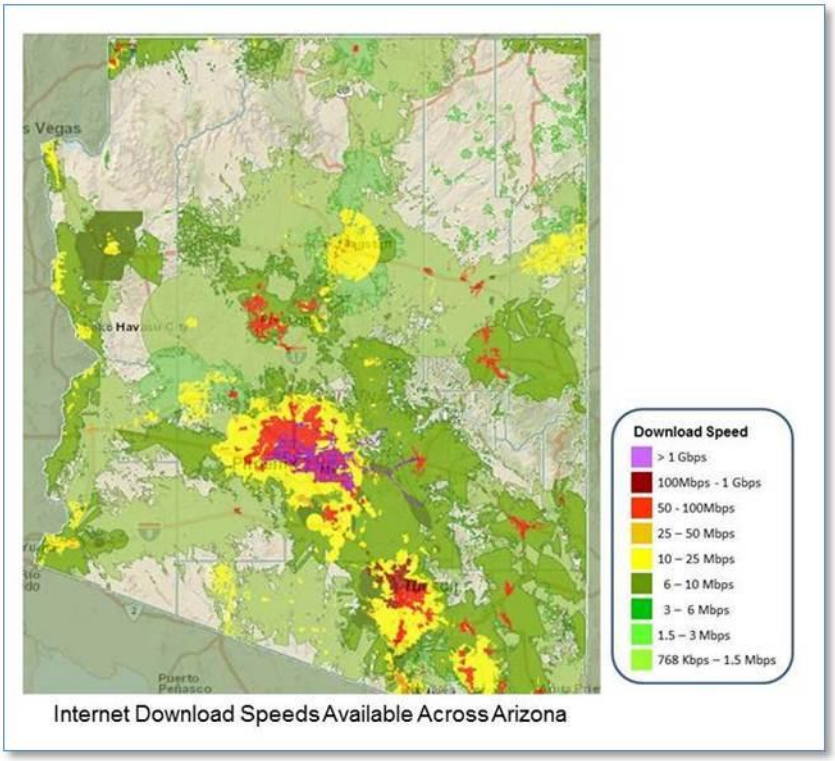
Broadband Initiatives

According to the 2012 report, "Arizona's Strategic Plan for Digital Capacity,[54]" advancing Arizona's digital infrastructure is fundamental to progress in every area of society including: education, healthcare, research, business, public safety, government and the environment.

U.S. Census data reveals Arizona ranks 18th in broadband coverage among the states and District of Columbia with 79.1% of Arizonans living in households with Internet access. At 64.6%, Arizona ranks 31st in individuals accessing the Internet at home and 34th among the 50 states in average digital connection speeds.

There are major barriers to overcome for rural Arizona's digital build-out. These include the costs and delays in permitting processes, lack of consistent rules among jurisdictions, inadequate long-distance connections infrastructure (middle mile), and lack of network resiliency.

The figure below depicts Arizona's wide gaps in high speed internet availability.[55]



Internet Download Speeds Available Across Arizona

Digital Arizona Program[56]

ASET is leading the program to identify needs for, and encourage collaboration on, the expansion of Broadband. The goal is to promote job growth and economic development in Arizona, while lowering overall communication costs. The Digital Arizona Program will create economic models to quantify the long-term benefits and costs for sample rural communities in the near future. Described below are two of the initiatives included in the Digital Arizona Program.

- **Broadband Mapping and Planning Federal Grant**[57]
  Arizona received a $2.3 million grant from the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) for this project. The Broadband mapping project will collect and verify the current availability, speed, and location of Broadband across Arizona.

- The State of Arizona was also awarded an additional $4.064 million by the National Telecommunications and Information Administration (NTIA) to map and plan expansion of Broadband access.

Arizona Broadband Grants to Enhance Capabilities

Arizona has been the recipient of tens of millions of dollars in federal assistance for programs to enhance rural broadband capabilities. Examples of initiatives funded with these grants include:

- The Tohono O'odham Utility Authority (TOUA) received a $3.6 million loan and a $3.6 million grant to design, engineer and construct a digital network to replace dial-up service. They also were awarded a second round USDA Broadband grant for $10,307,000 that serves as a last mile infrastructure project
- The Navajo Tribal Utility Authority (NTUA) was awarded approximately $32.2 million federal grant to provide middle mile and last mile Broadband infrastructure access to the Navajo Nation.
- The San Carlos Apache Telecommunications Utility, Inc. (SCATUI) was awarded a $10.5 million grant/loan that will provide fiber-to-the-premise (FTTP) service to the San Carlos Apache Reservation in Arizona.
- Hopi Telecommunications Inc. (HTI) was awarded a $3.6 million grant/loan that will connect Jeddito, Arizona with existing Broadband infrastructure more than 60 miles away.
- The Arizona Telephone Company was awarded a $4 million USDA grant to fund Broadband expansion projects in three rural areas of Arizona.
- GovNET, Inc. was awarded a $39.3 million grant to offer affordable middle-mile Broadband service in Arizona.
- The Havasupai Reservation and two scientific research facilities will benefit from a $2.2 million USDA Rural Utility Services (RUS) grant to implement the Northern Arizona Data Internet Network Extension (NADINE) to provide 300 Mbps of capacity to rural areas on the reservation.
- Midvale Telephone Exchange received a $1.115 million USDA Rural Utility Services (RUS) grant to provide Broadband service at speeds of at least 20 Mbps in the Prescott Prairie, Mingus Meadows, and Mingus Mountains areas of Henderson Valley. They also received a $2.147 USDA Rural Utility Services (RUS) grant to provide Broadband services.

Governor Jan Brewer recently signed into law the landmark Digital Arizona Highways Act of 2012[58], allowing conduit for fiber optic cables to be built along Arizona's highways using the State's rights-of-way. This will continue to enhance Arizona's ability to bring high-speed internet to its rural areas.

State Supported Public-Private Collaborative Initiatives

Arizona Health-e Connection Roadmap

In 2006 Arizona developed the Arizona Health-e Connection Roadmap[59]. This roadmap has provided the foundation for many of the HIE initiatives within the state. The roadmap described an overall approach for connecting Arizona healthcare providers and in many cases, focused specifically on the health information exchange that would be required among providers within a medical trading area (MTA) as well as across the state.

Example initiatives from the Roadmap, listed below, continue to be important today:

- Governance. Convening and supporting a broad range of interests and geographies to come together around the possibilities of moving e-health forward for Arizona.
- Privacy, Security, and Legal. Identifying and addressing issues that are needed to ensure e-health information exchange is confidential and secure, including legislative actions.
- Marketing and education. Developing a statewide portal to provide a one-stop access point to statewide resources, tools, and education.
- Technology. Recognizing the need for secure messaging between providers in addition to a fully robust HIE.
- Rural challenges. Understanding and beginning to address the unique challenges present in rural communities. For example: broadband availability and cost, the need to receive medical care within the borders of other states, the different levels of technology implementation, and skilled resources.

Arizona Health eConnection (AzHeC)[60] – Regional Extension Center

In April 2010, AzHeC was awarded a grant by the Office of the National Coordinator for Health Information Technology (ONC) to develop a regional extension center (REC) to assist Arizona health care providers with EHRs and Meaningful Use. The Arizona Regional Extension Center (REC) is one of 62 federally funded and designated RECs nationwide that serves as an unbiased, trusted resource with national perspective and local expertise. The REC offers membership and "hands-on" technical assistance services to qualified health care providers.

Arizona Health-e Connection (AzHeC) administers the Arizona HIE Marketplace[61] program under the direction of the State of Arizona and the Arizona Strategic Enterprise Technology (ASET) office. This program provides viable HIE options to any willing Arizona health care provider and assists providers participating in secure exchange of health information.

AzHeC developed a marketplace for the DIRECT approach through services offered by health information service providers (HISPs). DIRECT is also known as a “push” technology as it will push data electronically – directly from one provider to another.

As of 11/29/2012, over 670 providers had established DIRECT Exchange secure messaging accounts. There are over 800 additional providers who have expressed interest and are going through the education and on-boarding process to establish accounts.

Example use cases for DIRECT include:[62]

- Community health centers sending referrals to specialists and hospitals
- A county correctional facility sending inmate care summaries to state prisons when inmates are transferred between facilities
- An accountable care organization employing DIRECT exchange to coordinate care among providers in their network
- A behavioral health facility connecting with other providers, pharmacies, labs and acute care facilities
- Rural providers sending patient referrals to specialists and hospitals in urban areas
- Public health reporting, such as immunization reporting

The HIE Marketplace identifies and publishes information about health information exchange options, through an ongoing review and approval process, to ensure that Arizona health care providers are able to choose the best HIE option for their facility or practice. In 2013, AzHeC will be expanding the HIE Marketplace to review applications from organizations interested in being listed in the Provider Directory as "query based - robust HIE" in addition to the organizations already listed for "push - DIRECT HIE" capabilities.

Health Information Network of Arizona (HINAZ)[63]

The Health Information Network of Arizona (HINAz) represents a collaborative effort of major health care entities in Arizona including hospitals, large group practices, laboratories, health plans, as well as business and consumer representatives. HINAz has a rich history, as it is the collaboration of two important HIE initiatives. Beginning in 2004, the Southern Arizona Health Information Exchange (SAHIE) formed when the health care community in Southern Arizona began to explore the possibility of a regional Health Information Organization (HIO). In 2007, the Arizona Health Care Cost Containment System (AHCCCS) received $16 million in federal funding through a Medicaid Transformation grant to form the Health Information Exchange and Electronic Health Record utility program, which eventually would become the Arizona Medical Information Exchange (AMIE), an HIE effort in Maricopa County. In 2010, SAHIE and AMIE merged to create a single state-wide HIO called HINAz.

HINAz and their technology partner Axolotl/Optum were awarded a core services[64] contract by Arizona Strategic Enterprise Technology (ASET) to establish a provider directory for the statewide HIE. The HIE, when fully operational will include the capability for providers to push information to the HIE, as well as the capability to query the information. The first phase will establish a Provider Directory. The second phase will include a Master Patient Index and Record Locator Service. As described above, this effort is known as "robust HIE" because it includes the ability to both push data and also to query for data.

Interview Summary

During August and September of 2012, interviews were conducted to inform the State of Arizona and the Arizona Strategic Enterprise Technology (ASET) office about the issues and opportunities facing health care providers regarding health information exchange (HIE). Rural health care providers were among those interviewed.

The interviews were structured to elicit information in three broad subject areas: Barriers to HIE; Drivers of HIE – those things that motivate participation; and Assistance needed to move forward with HIE. The interviews revealed a wide variety of comments in each subject area, which were grouped into categories within each specific area. Those categories that were mentioned most often are listed below:

Barriers to HIE

- Cost
- Insufficient Resources
- Lack of EMRs

Drivers of HIE Participation

- Better patient care
- Better relationships and hand-offs with other healthcare providers
- Required reporting

Assistance Needed for HIT/HIE

- Education / Outreach
- Expertise / Resources
- EMR Upgrades
- Interface development

The complete interview report, "***Arizona HIE Environmental Scan and Community Interviews***," including all interview summaries, findings, and recommendations, can be downloaded from the ASET website at http://hie.az.gov/it.htm.

Arizona Organizations Supporting Rural Providers

Arizona Association of Community Health Centers

The Arizona Association of Community Health Centers (AACHC)[65] is the Primary Care Association (PCA) for the State of Arizona. All states have one designated PCA to advance the expansion of Federally Qualified Health Centers (FQHCs) and advocate for the health care interests of the medically underserved and uninsured.

AACHC, as a result, has many programs to assist member community health centers and the disadvantaged populations they serve. These programs vary from centralizing financial information and educational opportunities for members to peer networking committees for the sharing of best practices.

Arizona Rural Health Association

The Arizona Rural Health Association, Inc. [66] is an advocate on behalf of the health needs of rural Arizonans at national, state, and local levels. Its multidisciplinary membership provides a respected and highly effective group of rural health practitioners and rural community residents.

Arizona State Office of Rural Health Program

The Arizona State Office of Rural Health[67] (AzSORH) grant program was established in 1990, under the authority of congressional legislation that launched the State Offices of Rural Health grant program. The program is designed to be flexible enough to meet emerging health-related needs throughout the rural areas of the state.

AzSORH provides technical assistance to help rural health organizations form networks and become self-sustaining. AzSORH is involved in several rural networks, including the Arizona Rural Women's Health Network, Santa Cruz County Adolescent Wellness Coalition, and Arizona Border Communities Health Network "Redes Sin Paredes."

The federally-mandated goals of the program are to:

1. Improve collection and dissemination of information
2. Coordinate rural health resources and activities statewide
3. Provide technical assistance to rural communities
4. Encourage recruitment and retention of health professionals in rural areas
5. Participate in strengthening state, local, federal, and cross-border/bi-national partnerships.

The AzSORH participates in the National Organization of State Offices of Rural Health,[68] the National Rural Health Association,[69] and collaborates on a wide variety of programs with the Arizona Rural Health Association[70].

Center for Rural Health (CRH)

The Center for Rural Health is designated the Arizona State Office of Rural Health (AzSORH) through the State Offices of Rural Health Program, which is an initiative of the Office of Rural Health Policy (Department of Health and Human Services, Health Resources and Services Administration). For over twenty-five years, the Center for Rural Health[71] (formerly Rural Health Office) has served the State of Arizona through its mission to promote the health of rural and medically underserved individuals, families, and communities through service, education, and research.

Now situated within the University of Arizona Mel and Enid Zuckerman College of Public Health, the AzSORH program forms the core infrastructure, along with legislated funding from the state of Arizona, for the Center for Rural Health. The Center for Rural Health's combined state, federal, and other funding sources are collectively coordinated to positively impact rural and border health.[72]

Environmental Scan: States

The following section describes initiatives in various states that provide examples of how rural health is being included in HIE activities.

California

Report: "California State Rural Health Association Rural Providers and eHealth: The Future is Now - February 2010"

The report "*California State Rural Health Association Rural Providers and eHealth: The Future is Now February 2010*"[73] showcased three HIT projects operating in California at that time: Southern Sierra Telehealth Network, covering a large multi-county service area in rural Southern California; the Greater Sierra Integrated Health Organization, serving Nevada County; and Access El Dorado, connecting multiple providers in El Dorado County.

Major Challenges faced by the projects included:

- The complexity of finding sufficient financing to match the project's desired time frame
- Keeping their collaborative partners engaged during long planning processes
- Inconsistent access to broadband connectivity to support technological innovations

Key Success Elements in each of these projects included:

- Strong local partnerships that supported significant participation by clinical providers and, as a result, shared agreement on technology products and services
- The ability to attract outside funding to support upfront costs of planning, installation and operation
- The aggregation of needs and resources to develop economies of scale and efficient operations
- Detailed sustainability plans which outline how the eHealth projects will be sustained after external funding is exhausted

Lessons Learned

The lessons learned from these initiatives are well-documented and share the following common themes:

- The adoption of eHealth technology is less about the technology and much more about the impact of this technology on the workflow, culture, and operations of an organization.

- A number of elements need to be in place to ensure a successful eHealth implementation, including:
  - Sufficient financial resources, both short-term and long-term
  - Committed and dedicated clinical and administrative leadership at all levels of the organization
  - Organizational readiness to change its internal processes
  - Sufficient training and technical support both during and after installation to ensure widespread and deep adoption
- For most small to mid-size organizations, there are significant benefits to collaborating with other partners, either on a geographic basis or through horizontal provider networks that span regions or even states.
- The installation of a new eHealth technology alone will not improve health care quality.
- Reimbursement must be restructured to enable and incentivize safety-net providers to fully utilize eHealth technologies.

Other HIE activity in Rural California

Greater Sierra Integrated Health Organization (GSIHO)[74] – Nevada County

Under the leadership of Sierra Nevada Memorial Hospital (SNMH), Nevada County healthcare providers are poised to implement a county-wide shared electronic health record system connecting over 100 physicians, two hospitals, and several FQHCs and RHCs in the county. To date SNMH has been successful in obtaining $761,000 in funding through federal earmarks and private grants for the Community Connect project.

The health care system in Nevada County, located about ninety minutes northeast of Sacramento, is anchored by two rural hospitals located in the western and eastern parts of the county. Most of the 150 private physicians in the county are solo practitioners, and have limited resources to invest in new technologies. The Community Connect goal – sponsored by an EHR vendor – is to create a community-wide EHR that will be used by all of the health care providers in the region. It should be noted that this project is concentrated on implementing a common EMR vs. a multi-EMR integrated HIE.

Obtaining outside funding to support the development of its county-wide EHR system has been the biggest challenge for GSIHO to date. GSIHO's sustainability plan relies on wide-spread participation by the county's health care providers to pay for hosting of the EHR system on the hospital's ASP.

ACCEL (Health Access El Dorado)

ACCEL's Health Information Technology Program[75] is implementing electronic services that support interagency systems integration to improve care delivery and coordination. The initial efforts of ACCEL were stalled until they could bring the community together for agreement on an HIE vendor. Once that was accomplished, the effort again began to move forward.

ACCEL is moving forward in selecting and implementing appropriate Web-based technology to link participating agencies in an HIE that shares essential clinical data among El Dorado County providers. This will include the capacity for disease surveillance, public health communicable disease reporting, and urgent community health alerts. The plan is that this will ultimately lead to a Health Information Exchange (HIE) connecting public and private health care providers across the county.

Lessons Learned

The most important lesson to be learned from ACCEL is the value of taking the time needed to strengthen the ability of the health care providers to work together before introducing technology as a solution. ACCEL developed strong relationships, built trust, overcame privacy and security issues, and outlined clear workflow and care pathways that have resulted in tangible improvements in health outcomes. This strong collaborative foundation served them well in making difficult decisions to postpone premature forward motion on HIE so that individual partners could first strengthen their internal EHR systems.

East Kern County Integrated Technology Association ("EKCITA")

The East Kern County Integrated Technology Association[76] ("EKCITA") is a 501(c)(3) not-for-profit organization, formed through a grassroots community effort in 2006 via a federal research initiative. The purpose of EKCITA is to: 1) demonstrate secure and appropriate sharing of electronic health files and clinical data for public health, patient care, and research; and 2) to develop, improve, and assist in the implementation of health information technology for all physicians, caregivers, health-related institutions and consumers in, but not limited to, southeastern Kern county.

EKCITA is not a typical health information organization (HIO) in that it also holds the licenses for the electronic health record (EHR) software solutions installed at various rural health clinics and private practices in the region; holds the license for a custom designed, web-based personal health record (PHR); and is responsible for the open source health information exchange (HIE) system that was designed by the local providers. EKCITA's HIE will enable the secure transmission of data and also support population based quality improvement and research studies.

EKCITA is comprised of a local critical access hospital, a medical group, six private provider offices, and three rural health clinics. EKCITA is exchanging patient demographic information, encounter data, lab results, radiology transcription reports, and medication and allergy lists.

North Coast Health information Network

North Coast Health Information Network's (NCHIN) [77], purpose is to provide information exchange in Humboldt County. NCHIN is a California nonprofit and the successor organization to a community collaborative hosted by the Humboldt Del Norte IPA and Foundation (HDN). The parent organization, HDN, is a community leader, initiating the expansion of information technology projects in conjunction with local health care providers in community collaboratives.

NCHIN is building a health information organization (HIO) with the capability to interface lab results with data from local hospitals. It will also provide a method for creating and transporting continuity of care documents (CCDs) by adding functionality to the existing electronic referral system in the community.

Colorado

Poudre Valley Health System[78]

Poudre Valley Health System has been a connected system since April 2011. The need for exchange with the smaller facilities in their region was prompted by the many patients seen by Poudre Valley Health system from these rural providers. They are participating in a pilot to exchange data, through CORHIO, with smaller facilities in northern Colorado. The first phase of exchange included lab tests, clinical reports, and patient demographics. As of September 2012, CORHIO announced the addition of multiple hospitals in Northern Colorado as full participants in the HIE.

Louisiana

Louisiana Rural Health Information Exchange

In 2007 the Rural Hospital Coalition formed the Louisiana Rural Health Information Exchange (LARHIX) with $13M in funding provided through the Louisiana Department of Health and Hospitals (LaDHH).[79] LARHIX is a partnership between the Louisiana Regional Health Center (RHC) and the LSU Hospital System (LSUHS) and currently consists of 26 RHC member hospitals in central and northern Louisiana and the LSU tertiary hospital in Shreveport.

The services provided by LARHIX include:

- Electronic medical records (EMRs), picture archiving and communication systems (PACS), and financial systems.
- Connectivity to a clinical portal which provides secure access to 1.1 million patient records and enables health information sharing among the rural hospitals.
- Videoconferencing equipment was installed at LSUHSC-S and all 26 rural hospitals to enable tele-consultations; patient education on topics such as diabetes, wound care, and diet; and distance learning for clinicians.
- A mobile mammography van provides mammograms to underinsured and uninsured women with real-time results reporting at the conclusion of their appointment.

Lessons Learned

Key lessons learned by LARHIX include:

- The importance of engaging physicians in the process
- Defining the value proposition for stakeholders
- Actively promoting the project to the end users
- One size (exchange or EMR) does not fit all

Minnesota

Minnesota has been pro-active in providing grant funding to assist its health care community adopt EMRs and participate in HIE. Two grant programs were designed and implemented in the last two years for that purpose and are described below.

2011 Minnesota e-Health Connectivity for Health Information Exchange Grant Program[80]

The 2011 Minnesota e-Health Connectivity for Health Information Exchange (HIE) Grant Program was designed to address unmet needs related to health information exchange for qualifying clinics, hospitals, and pharmacies. In particular, it aimed to:

- Assist qualifying clinics and hospitals in rural and underserved communities that are currently unable to exchange health information electronically, and require assistance in selecting and/or connecting to a state certified health information exchange service provider.
- Assist rural pharmacies serving ambulatory patients in cities with populations of less than 10,000 people that are currently unable to accept electronic prescriptions or meet the requirements for exchange without updating their existing systems.

Eligible applicants include Community HIE Partners (two or more organizations coming together in a collaborative effort in their communities to implement health information exchange for meaningful use transactions) or pharmacies not able to accept electronic prescriptions.

Grant awards range up to $25,000 per HIE partner site or $10,000 per pharmacy.

2012 Minnesota e-Health Connectivity Grant Program for Health Information Exchange

The 2012 Minnesota e-Health Connectivity Grant Program[81] for Health Information Exchange will provide grant funding to expand community-based collaborative HIE efforts by providing funding to:

- Assist health and health care providers meet requirements for federal incentives for meaningful use of an EHR and/or,
- Expand health information exchange capability among health care providers and other trading partners to support care and/or public health, and/or,
- Increase the number of Minnesota pharmacies capable of accepting electronic prescriptions.

Montana

Health Information Exchange of Montana (HIEM)

The Health Information Exchange of Montana[82] (HIEM), a consortium of five hospitals and two federally funded community health centers in northern areas of the state, led a partnership including the Federal Communications Commission (FCC) and Burlington Northern Santa Fe Railway (BNSF) and local telecommunications providers to update fiber optics connections.[83]

BNSF Railway was instrumental in helping with the first section of the network route with fiber that follows the tracks from the towns of Whitefish to Conrad over the Continental Divide, which is rugged and mountainous terrain, and where communities are geographically isolated.

In recent years, the railway has placed fiber along their right of way in the region over the mountains and forests of Glacier National Park and the Blackfeet reservation.

With $13.6 million from the FCC's Rural Health Care Pilot Program and $2.4 million cash match from local network partners, HIEM, which formed in 2006, plans to connect 21 hospitals and clinics to create one of the most advanced healthcare technology networks in Montana.

HealthShare Montana HIE Connection Grants

In September 2011, HealthShare Montana[84] sponsored a grant program focused on helping Montana Critical Access Hospitals increase access to health information exchange (HIE) systems. Grants were used to:

- Provide an IT professional to perform an HIE needs-assessment;
- Arrange and/or provide funds for contracted IT personnel to install necessary hardware;
- Supply hardware needs such as firewalls, routers, switches and cabling; and
- Provide initial interface costs, which include the first year of maintenance.

North Carolina

2012 Community Health Center Grants[85]

In 2012, the North Carolina Office of Rural Health and Community Care identified up to $750,000 in Community Health Grant funds to assist safety net providers build the capability to share data via the North Carolina HIE (NC HIE). Applicants could request up to $195,000 in total.

This Initiative targets funding to essential primary medical care safety-net providers such as state-recognized rural health clinics, health departments, federally qualified health centers, and free clinics. Initiative funding may be used to support safety net providers' connection-related costs to/from the NC HIE and to purchase hardware and/or software necessary for a functional connection. Once installed, any hardware/software becomes the property of the safety net organization rather than the applicant. Connections supported by this initiative must ultimately permit the sharing of patient health information via the NC HIE.

North Dakota

North Dakota Flex CAH HIT Network Implementation Project

The goal of the North Dakota Flex CAH HIT Network Implementation Project[86] was to facilitate the exchange of health information by implementing a patient-centered electronic medical record (EMR) along the continuum of care – facilitating patient safety, efficiency, and effectiveness of health care services. The objectives of the project were to:

- Assist CAHs with the implementation of EMRs and the sharing of patient data with at least one ancillary facility within their respective communities.
- Facilitate the exchange of patient information between the CAH, ancillary facility, and the regional tertiary center.
- Strengthen the regional network to address HIT needs and issues.

Three North Dakota CAHs, one tertiary referral hospital, and several ancillary providers associated with the selected CAHs (including a long-term care facility and health clinics) formed the network in this pilot project. The participating CAHs did not all choose the same provider for their EMR, and therefore individually focused on the implementation of those different EMRs and in the implementation of Clinical Workstation – a one-way portal between the rural facilities and the tertiary facility.

Lessons Learned

- Do not underestimate the time, work, and costs required to implement an EMR.
- Invest in planning and readiness activities prior to implementation.
- Anticipate the need for connections between the various participants and facilities.

Oklahoma

Northeastern Oklahoma Network

The Oklahoma Flex CAH HIT grant project[87] created a CAH Electronic Health Record (EHR) Network in Northeastern Oklahoma (the "Network"). The Network participants engaged in the Flex project were: Oklahoma State University (OSU) Medical Center; Drumright Regional Hospital (CAH) and Drumright Medical Clinic; Holdenville General Hospital (CAH), Holdenville Rural Health Clinic, Physician Health Clinic, and Allen Health Clinic; Fairfax Memorial Hospital (CAH); Bristow Memorial Hospital; and the private practice physicians who staff each hospital and are responsible for the majority of the hospital's referrals.

The Network members' vision for the EHR Network was to ensure that patient clinical information would be easily accessible to providers within a healthcare organization and to other providers as patients migrated from ambulatory care to acute service delivery sites within the region. Improving access to patient information by integrating it into a coordinated system of care was expected to lead to more effective and efficient health care delivery and ultimately to improved safety and quality of care for patients.

Each CAH received $291,500 and provided $8,500 matching funds to purchase and implement an EHR system at their hospital and in the physician offices of their staff physicians. OSU Medical Center, the tertiary referral hospital for the Network CAHs, received $350,000 and provided $650,000 in matching funds to purchase and implement an EHR system at its hospital.

Lessons Learned

- Designate a clinical or facility-level champion.
- Employ a knowledgeable HIT consultant.
- Establish relationships with other facilities familiar with the selected vendor's reputation.
- Recognize staff training needs.

Oregon

Gorge Health Connect

In a topographically constrained region of Oregon carved out along the Columbia River, most of the major hospitals, physician clinics and health and community agencies worked together to form Gorge Health Connect[88] (GHC) in 2009.

GHC is a health information exchange (HIE) that connects hospitals, federally-qualified health clinics, primary care providers, specialists, public health and others to share information on the region's 48,000 residents. GHC launched a DIRECT Project Pilot as an early offering and to move towards achieving the goal of widespread sharing of health information.

South Carolina

Lakelands Rural Health Network

The Lakelands Rural Health Network (LRHN) is a nonprofit multicounty vertically integrated network of hospitals, physician practices, and other providers in the counties of Abbeville, Laurens, Greenwood, McCormick, Edgefield, and Saluda developed in 2004 with the guidance of South Carolina Office of Rural Health.[89] This initial network's goal was to enhance efficiency, expand access, coordinate and improve the quality of essential health care services and strengthen the rural health care system as a whole.

A subsequent grant received during 2008-2009 built upon the achievement of the prior grant. The purpose of this grant project[90] was to acquire the necessary funding and technical resources to implement a regional health information exchange and quality improvement initiative in the Lakelands area of western South Carolina. The goals for this grant were to:

- Serve as the South Carolina rural pilot site for an already developed HIE technology platform that includes a personal health record; and
- Establish a regional quality improvement (QI) program and reporting function within the HIE.

Lessons Learned

- Build on established vendor relationships.
- Technology is only one part of the equation.
- Plan HIE implementation.
- Implementing an HIE requires the collaboration and coordination of many providers and entities. This makes the implementation of HIE much more complicated and harder to predict than the implementation of EMRs alone.
- Sustainability will be difficult.

Utah

UHIN and VA connect

The Utah Health Information Network (UHIN) developed a pilot program to connect healthcare providers in the Moab, Utah region, with the Department of Veterans Affairs to help patient care coordination and access to healthcare services for veterans and service members.[91] UHIN enabled clinical HIE to the VA using Nationwide Health Information Network (NHIN) protocol.

The initiative was the first pilot to extend services to rural areas in a series of nationwide pilot programs to expand services to veterans through NHIN, and among the first to electronically link VA clinicians' patient data with physicians and services generated at non-VA facilities located across the state.

Washington

Western Washington Rural Health Care Collaborative

Western Washington Rural Health Care Collaborative (WWRHCC), a nonprofit health network comprised of 10 critical access hospitals, serves some 288,000 residents who for the most part are elderly and uninsured, underinsured, or are Medicare/Medicaid beneficiaries.

In 2007, WWRHCC received a $1.4 million Flex CAH Health IT grant,[92] which required the health network to enable connectivity for sharing pharmacy information between three of its CAHs and each of their respective rural health clinics. This grant also allowed WWRHCC to share information for trauma patients with a large tertiary hospital, Seattle-based Harborview Medical Center. Now physicians at Harborview's emergency department can access information for trauma patients that are en route to their facility.

In 2011, WWRHCC received a health information technology network development grant from HHS. WWRHCC will receive almost $300,000 in the first year to assist five members: Forks Community, Whidbey General, Morton General, Willapa Harbor, and Ocean Beach. The hospitals will use the funds to adopt electronic health records and other health IT tools and to qualify for Medicare and Medicaid incentive payments for the meaningful use of EHRs. The grant funds will also be used to purchase equipment, software, and provide training for staff members.

Lessons Learned

- Engage physicians from the early planning stages of the project.
- Implementation of an HIE is heavily dependent on IT support. Commitment and retention of IT staff is essential when implementing a Health Information Exchange (HIE).
- Limited user licenses can become particularly problematic when incorporating a large tertiary facility into an HIE.

Wisconsin

Rural Wisconsin Health Cooperative Information Technology Network

The goal of the Wisconsin Flex CAH HIT grant project[93] was to implement a collaborative electronic health record environment – initially consisting of a hospital information system and a physician practice EMR system – that is shared by multiple CAHs from a common datacenter and supported by a pooled staff. In this model, a single CCHIT certified vendor provides the EHR software, and a collaborative non-profit entity supports a shared staffing structure and a shared data storage center.

The Rural Wisconsin Health Cooperative Information Technology Network (ITN) is the nonprofit consortium organization that operates the collaborative EHR environment. The ITN's mission is "to provide community hospitals and their affiliates with HIT applications and support services that promote high quality, cost effective healthcare."

Appendix

Arizona's Critical Access Hospitals (CAHs)[94]

Hospital	Location	County
Benson Hospital	Benson	Cochise
Carondelet Holy Cross Hospital	Nogales	Santa Cruz
Cobre Valley Regional Medical Center	Globe	Gila
Copper Queen Community Hospital	Bisbee	Cochise
Hopi Health Care Center	Polacca	Navajo
Hu Hu Kam Memorial Hospital	Sacaton	Pinal
Little Colorado Medical Center	Winslow	Navajo
Northern Cochise Community Hospital	Willcox	Cochise
Page Hospital	Page	Coconino
Parker Indian Health Center	Parker	La Paz
Sage Memorial Hospital	Ganado	Apache
Southeast Arizona Medical Center	Douglas	Cochise
White Mountain Regional Medical Center	Springerville	Apache
Wickenburg Community Hospital	Wickenburg	Maricopa

Arizona's Federally Qualified Health Centers (FQHCs)[95]

FQHC	Location	County
Adelante Healthcare, Inc.	Multiple	Maricopa
Canyonlands Community Health Care	Page	Coconino
Chiricahua Community Health Centers, Inc.	Douglas	Cochise
Community Health Centers of West Yavapai	Prescott	Yavapai
Desert Senita Community Health Center	Ajo	Pima
El Rio Health Center	Tucson	Pima
Marana Health Center, Inc	Marana	Pima
Maricopa County Health Care for the Homeless	Phoenix	Maricopa
Maricopa Integrated Health Systems Clinics (FQHC look-alike) Mountain Park Health Center	Phoenix	Maricopa
Mariposa Community Health Center, Inc.	Multiple	Santa Cruz
Native Health	Phoenix	Maricopa
North Country HealthCare	Multiple	Multiple
Sun Life Family Center Health	Multiple	Pinal
Sunset Community Health Center	Yuma	Yuma
United Community Health Center, Inc.	Multiple	Pima
Wesley Community Center	Phoenix	Maricopa

Arizona's Rural Health Clinics (RHCs) [96]

Health Clinic	Location	County
Bouse Medical Clinic	Bouse	La Paz
Community Hospital Clinic at Wickenburg Community Hospital*	Wickenburg	Maricopa
Copper Queen Community Hospital*	Bisbee	Cochise
Copper Queen Community Hospital* - Douglas Clinic	Douglas	Cochise
Greasewood Clinic*	Ganado	Apache
Kearny Clinic*	Kearny	Pinal
La Paz Regional Hospital* (Quartzsite - Urgent Care)	Quartzsite	La Paz
Palominas / Hereford Rural Health Clinic*	Palominas	Cochise
Pleasant Valley Community Medical Center (Urgent Care)*	Young	Gila
Rightway Healthcare	Casa Grande	Pinal
Sage Outpatient Clinic*	Ganado	Apache
San Luis Walk-In Clinic	San Luis	Yuma
Sulphur Springs Medical Center*	Willcox	Cochise
Sunsites Medical Center*	Pearce	Cochise
Superior Clinic	Superior	Pinal
Tri-Valley Medical center	Salome	La Paz
Wide Ruins Clinic*	Ganado	Apache

*CAHs affiliated RHCs

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