West Virginia Health Information Technology Infrastructure

Broadband Availability for Health Care Programs In West Virginia

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With the passage of key federal legislation in recent years, the use of health information technology to improve the cost and quality of health care has become the predominant focus for health care delivery in the United States. Through the use of electronic health records and other health information technology initiatives, new methods and models for delivering and enhancing the quality of care, and for measuring the outcomes of that care, are at the forefront for improving the health care delivery system.

Broadband availability has become the single most important requirement for change in West Virginia's health care system. It is the conduit for enhanced and timely communications between doctors, doctors and patients, doctors and pharmacists and other health care providers. It facilitates the provision of medical care to unserved and underserved populations through remote diagnosis, treatment, monitoring, and consultations with specialists through telemedicine.[1] Rather than delaying treatment, broadband allows providers to communicate with other providers to facilitate health care interventions and timely treatments in areas lacking advanced diagnostic capabilities and specialty services.

Broadband and the use of health information technology is transforming health care by:

- leveling the playing field between urban and rural medical capabilities;
- reducing health care costs by enabling the widespread use of electronic health records;
- facilitating timely diagnoses and treatments;
- leveraging global resources to find efficiencies; and
- empowering individuals to manage personal health decisions.[2]

The availability of broadband drives the implementation of health information technology for providers and enhances their ability to use technology resources to meet requirements and expectations, not only at the local level, but nationally as well. Generally, broadband enables hospitals, providers and clinics to ultimately improve the care provided, while decreasing associated costs.

History and Progress

In 2008, the West Virginia Legislature passed HB 4637 requiring the West Virginia Health Care Authority (WVHCA) to develop a written report for the Broadband Deployment Council detailing existing broadband capabilities and unmet need for West Virginia's health care system as follows:

> *The Chair of the West Virginia Health Care Authority shall submit a written report to the council by the thirty-first day of October of each year describing in detail the existing broadband infrastructure owned, leased, used, operated or purchased by all hospitals, medical facilities, clinics or healthcare providers; all programs initiatives, or applications utilizing broadband that are promoted by hospitals, medical facilities, clinics, or healthcare providers; and any unmet demand for broadband by hospitals, medical facilities, clinics, or healthcare providers. W. Va. Code §31-15c-11(f).*[3]

The Patient Protections and Affordable Care Act of 2010 (PPACA)

In recent years, the healthcare system has focused on new methods for improving the quality of healthcare while supporting patients' ongoing management of chronic conditions proactively. While the use of health information technology, particularly electronic health records, has become the impetus for accomplishing these goals, new technology is rapidly improving programs that not only promote accountable and coordinated care, but provide widespread integration of data that can be accessed and shared between providers and used for developing and implementing treatment plans.[4]

The most recent federal congressional action that facilitates the use of health information technology in the health care system is the Patient Protection and Affordable Care Act of 2010 (PPACA). One of the most significant requirements in the PPACA related to health information technology is the provision requiring the Department of Health and Humans Services' Secretary to integrate the electronic health record meaningful use incentives established by the Health Information for Clinical and Economic Health Act of 2009 (HITECH) with the reporting mechanisms of the Physician Quality Reporting System (PQRS) required by the 2006 Tax Relief and Health Care Act, which uses a combination of incentive payments and payment adjustments to promote reporting of quality information by eligible professionals.[5]

In order to achieve meaningful integration of the two separate programs, providers and organizations are being incentivized to implement electronic health record systems that enable the sharing of data seamlessly among the care team while having the ability to measure and report quality metrics using the same data.[4] Incentive payments for using electronic health record technology in a 'meaningful' manner, i.e., for submitting quantity and clinical quality measures,[6] is the mechanism being used by the federal government for providing higher quality care delivery, improved patient safety, and shared decision making by patients and physicians.[7]

Through federal legislation, providers are being rewarded for transforming health care delivery through health information technology implementation. Meaningful use incentives and all of the resources the federal government is making available to assist providers is encouraging electronic health record implementation at the practitioner level. Regardless of the system being used, providers are taking advantage of early electronic health record implementation incentives in-state as well as nationally.

A recent report from the Centers for Medicare & Medicaid Services (CMS) indicates the agency has made more than $15.5 billion in incentive payments to 80% of hospitals and 58% of physicians and health care providers that have implemented electronic health records that meet "meaningful use" requirements since the program launched in 2011. From January to June 2013 alone, CMS distributed nearly $831.5 million to almost 310,000 eligible providers and hospitals nationally, up from a total of 257,000 providers in 2012.[8]

As of August 2013, West Virginia Medicaid had distributed $53.8 million in health information technology incentive payments to West Virginia eligible providers and hospitals. **Table 1** details Medicaid's payment distribution by provider type.

Table 1

Total WV ELECTRONIC HEALTH RECORD PIP payments as of August 14, 2013					
Hospital Count	Hospital Amount	EP* Count	EP Amount	Total Count	Total Amount Paid
47	$38.4 million	815	$15.4 million	862	$53.8 million

*Eligible healthcare professionals [9]

As incentives are being paid, the data being gathered as a result of electronic health record (EHR) implementation will be used to measure health care improvements by provider, the results of which will be published on a publicly available website in the future. For providers who choose not to comply, penalties will be assessed through the reduction in reimbursements for services.[10]

Current Infrastructure

Health Care Connections

In order for providers to comply with federal requirements, the needed telecommunications infrastructure must be developed across the state, especially in rural West Virginia. Millions of dollars to deploy and enhance current broadband availability has been allocated to West Virginia through numerous grants. However, West Virginia still has the least access to ≥ 10 Mbps broadband among the states, according to the May 2013 report, "U.S. Broadband Availability: June 2010 – June 2012," released by the National Telecommunications and Information Administration.[11]

Broadband deployment is the focus of numerous public and private organizations, and efforts are ongoing to improve its availability. In July 2011, Frontier Communications Corporation reported that 76 percent of its West Virginia customers had access to high-speed broadband, up from 62 percent in June 2010. They pledged to offer high-speed services to at least 85 percent of the homes and businesses in its service territory by 2015.[11]

Programs that expand broadband help to ensure access to health care services in rural areas. For example, WVU Healthcare has expanded their telehealth programs by providing psychiatric services to clinics in 12 rural West Virginia counties through its telepsychiatric program. Since 2009, WVU telepsychiatrists have seen more than 11,000 patients via computer screen and webcam, thus, reducing the number of patients that must travel to receive appropriate treatment.[12]

The telepsychiatric program is an addition to WVU's telehealth program. Last year, the telestroke program was developed to provide a video-based, neurological care program that assists in the development of treatment strategies for patients who suffer a stroke. The program also provides the ability to share imaging scans and assists in the administration of intravenous, clot-dissolving drugs.[13]

The combination of federal incentives and contributions by programs to deploy broadband affords hospitals, providers and clinics the ability to rapidly implement new technology. Hospital & Health Networks magazine named WVU Healthcare as one of the "Most Wired" in both 2012 and 2013,[14] while U.S. News & World Report listed WVU Hospital as one of the most connected hospitals – clinically high-performing and advanced in their implementation of electronic health record systems;[15] United Health

Systems was named one of the "Most Wired" for small and rural hospitals.[14]

Broadband Makes It Possible

Numerous agencies and organizations are working to improve or make high-speed data communication available for hospitals, clinics, physician practices and other healthcare entities. As a result, many health care providers are presently able, or soon will be able to provide and measure health services and share patient health care information with other providers as needed.

Broadband makes it possible for West Virginia's providers to use the health care data collected through electronic health records, report nationally required measures, participate in health information exchange with other providers and coordinate care, improve health and provide efficient, cost effective care. Many West Virginia providers are presently implementing, or moving in the direction of implementing new technologies, while some providers have been implementing electronic health records, meeting meaningful use criteria and obtaining incentive payments for several years with the assistance of West Virginia's Regional Health Information Extension Center (WVRHITEC). In March 2013, the WVRHITEC had achieved its goal of helping 1,000 primary care providers in West Virginia adopt a certified electronic health record system.[16]

According to the U.S. Department of Health and Human Services, Office of the National Coordinator's HealthIT Dashboard, 44% of office-based providers, nationally, have implemented a basic electronic health record that includes specific functionality in the following areas of health care and administrative data: patient demographics, patient problem lists, electronic lists of medication taken by patients, clinical notes, orders for prescriptions, and laboratory results viewing.[17]

Table 2 provides the electronic health record adoption rate by West Virginia providers as noted from the Department of Health and Human Services, Office of the National Coordinator's HealthIT Dashboard.[17] While the overall provider adoption rate for West Virginia providers is smaller than the national rate, West Virginia primary care providers are adopting EHRs at a higher rate.

Table 2

Adoption of EHRs	Primary Care Providers	Rural Hospitals	Small Hospitals	Total E-Prescribers Using Surescripts Network	Overall Providers	Overall Hospitals
WV Rate	45%	56%	75%	97%	39%	64%
National Rate	44%	Not Available	Not Available	95%	40%	56%

Although many are using available technology, providers will not be able to use it to its fullest extent without high-speed communication. Using data from the West Virginia Broadband Mapping Program,[18] and the West Virginia Boards of Medicine and Osteopathic Medicine, broadband access and downstream speed for individual and group healthcare providers across West Virginia is depicted in **Figure 1**.

Figure 1
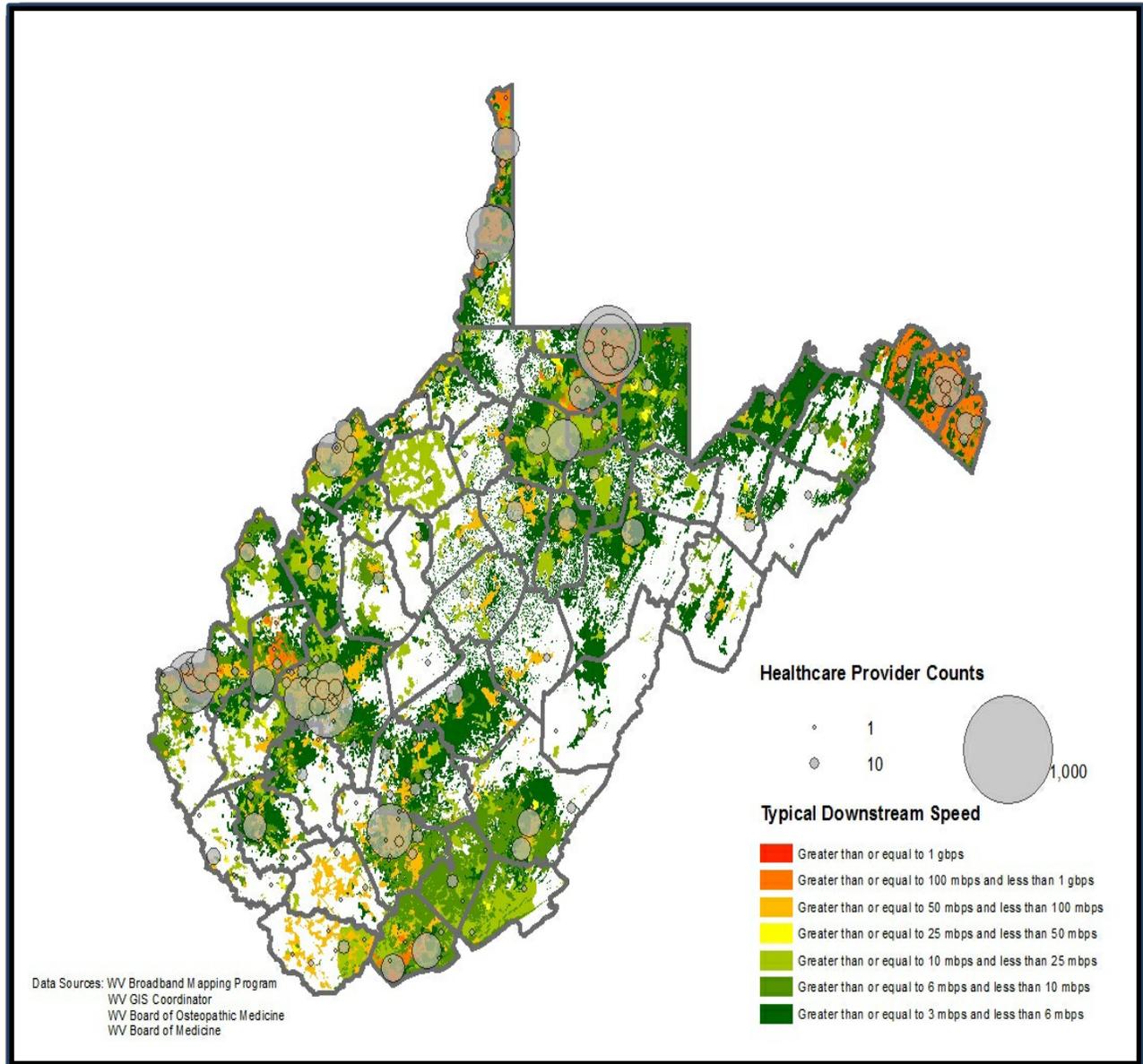
Broadband penetrates the majority of the provider office locations, but not all. There still seems to be a lack of available services for doctors in the southern part of the state and along the eastern border, including Hardy and Hampshire counties. These results are similar, if not the same as, the results reported in 2012.

Likewise, there also seems to be a lack of broadband service providers, as noted in **Figure 2,** in the same areas showing little or no access to broadband in **Figure 1**. Although most of the state health care providers in the rural areas have access to at least one broadband service provider that provides ≥3 Mbps, there seem to be few individual or group health care providers who do not have access to any type of service.

Figure 2

Total Number of Broadband Internet Providers

Healthcare Provider Counts

Data Sources: WV Broadband Mapping Program
WV GIS Coordinator
WV Board of Osteopathic Medicine
WV Board of Medicine
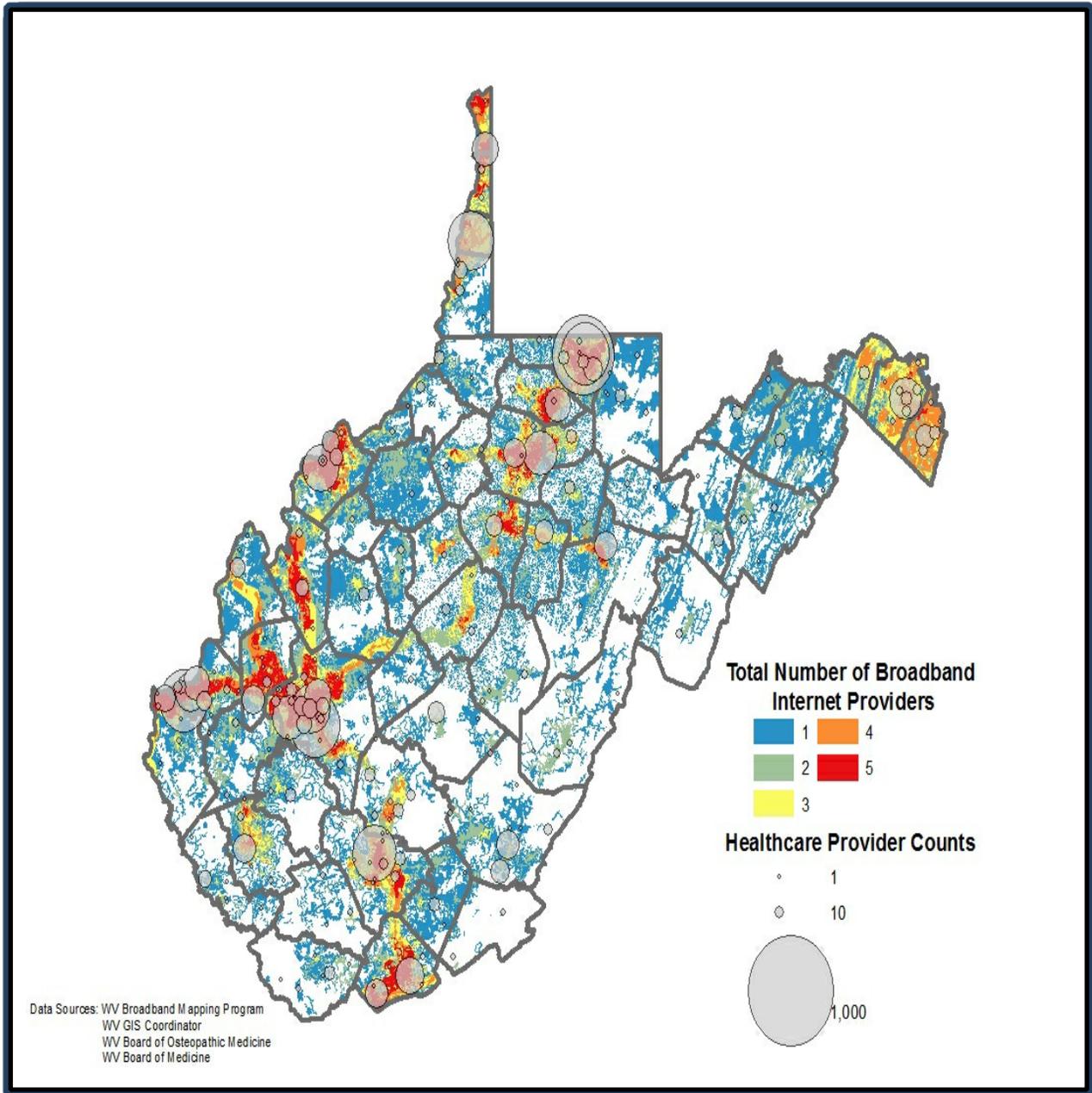
Fortunately, all West Virginia acute care and critical access hospitals have access to high speed communications (broadband), according to the National Telecommunications and Information Administration.[19] The availability of broadband for hospitals and other primary care facilities are depicted in **Figure 3**.

Figure 3
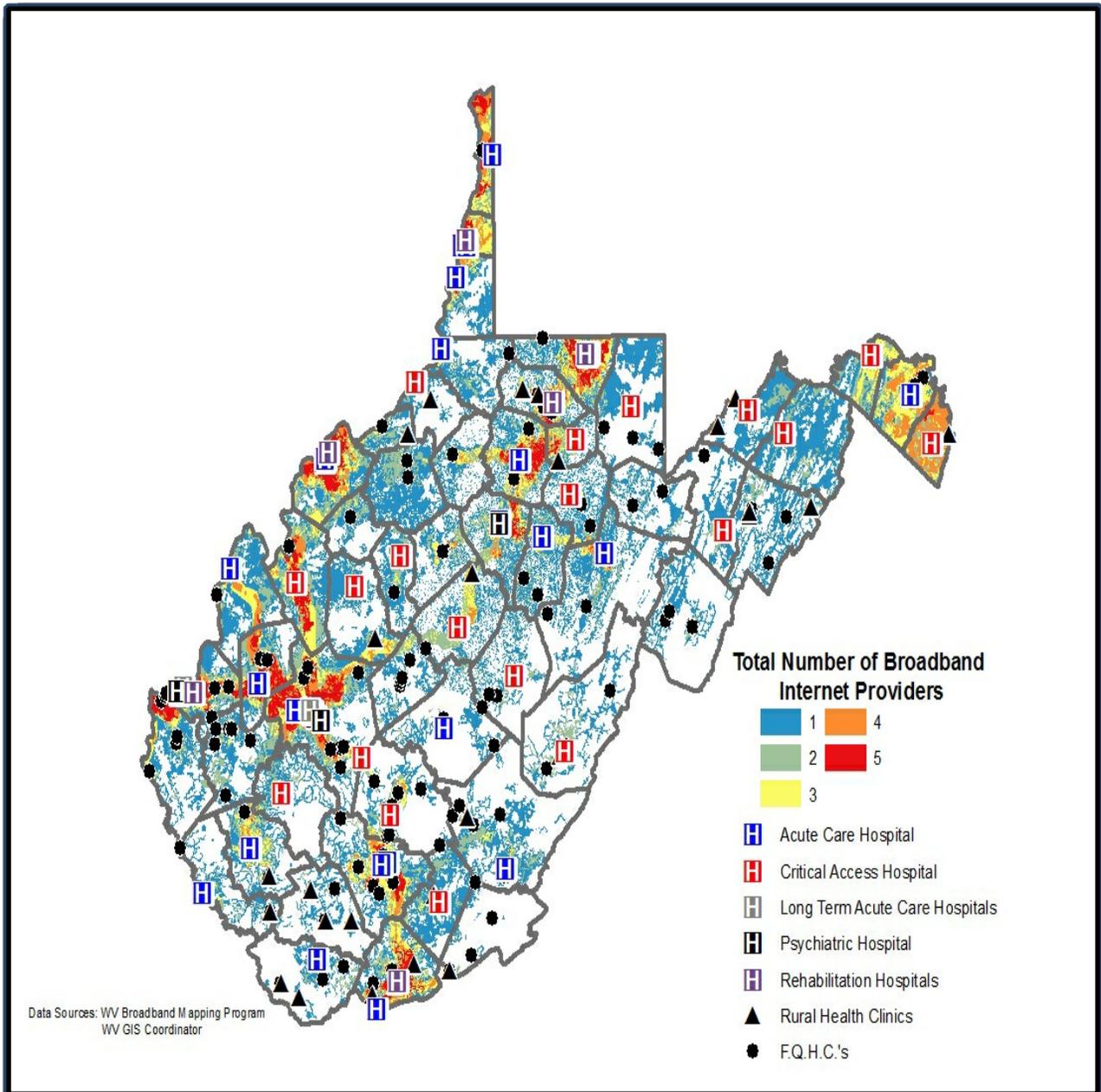
E-Prescribing

Broadband availability also impacts a clinician's ability to e-prescribe, an electronic means for sending prescriptions from the provider to a dispensing pharmacy.

Surescripts, the nation's largest e-prescription network, recognizes states with the highest e-prescribing rates and performance-based on the critical services that constitute e-prescribing: prescription benefit, medication history and prescription routing. As of December 31, 2012, Surescripts ranked West Virginia 18th in the nation for e-prescribing performance, up from 34th the previous year.[20]

Table 3 shows the growth in the adoption of e-prescribing by providers in West Virginia over a four year period.[20] The number of providers who are e-prescribers have almost tripled in the last four years, and activated pharmacies are growing each year as well.

*WV ranks 18th in the nation for e-prescribing performance.*

Surescripts, State Progress Report on Electronic Prescribing, December 31, 2012.[20]

Table 3

	2009	2010	2011	2012
Physicians Routing E-Prescriptions at Year-End	946	1302	2014	2370
Community Pharmacies Activated for E-Prescribing at Year-End	436	470	504	518

As shown in **Figure 4** and **Table 4,**[20] providers in West Virginia are increasingly utilizing available information via electronic means for identifying past and present prescription use prior to prescribing a particular medication and routing to a pharmacy electronically.

Figure 4

% Patient Visits Involving a Prescription Benefit Request
- 2010: 34 %
- 2011: 56 %
- 2012: 85 %
Source: Surescripts Data
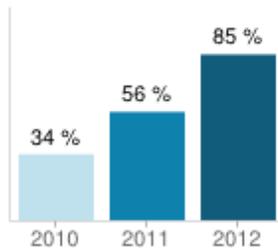
% Patient Visits Involving a Medication History Response
- 2010: 25 %
- 2011: 31 %
- 2012: 74 %
Source: Surescripts Data
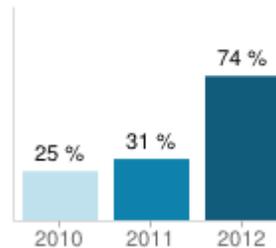
% Eligible Prescriptions Routed Electronically
- 2010: 12 %
- 2011: 22 %
- 2012: 34 %
Source: Surescripts Data
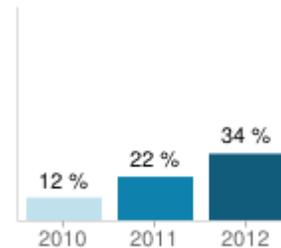
West Virginia e-prescribing utilization is increasing every year and nearly doubled between 2011 and 2012 as shown in **Table 4.**

Table 4

E-Prescribing Utilization[20]	2009	2010	2011	2012
Prescription Benefit Requests	1,219,781	3,252,778	3,463,649	7,135,267
Total Prescriptions Routed Electronically	1,055,556	1,618,580	3,237,822	5,033,512
Total Estimated Responses to Medication Requests	398,073	1,487,729	1,960,081	4,400,296

Federal incentive programs provided to eligible professionals who e-prescribe may have influenced the growth of e-prescribing. As these incentive programs were implemented, payments increased incrementally each year beginning in 2009. Beginning in 2012, incentive payments were not only reduced, but providers who were not successfully e-prescribing were subjected to a 1% payment reduction in their Medicare Part B Provider Fee Schedule payments; in 2014, payments will be reduced by 2.0% for those providers who do not comply with the electronic prescribing requirements.[21]

Health Information Exchange

Adopting the standards to facilitate e-prescribing was a key factor in the U.S. Government's plan to expedite the adoption of electronic medical records and build a national electronic health information infrastructure. The improvements made in patient safety combined with the incentives offered to prescribers not only increased the use of e-prescribing, but became the impetus for providers to begin exploring and using other available technologies to improve the health of patients.[22]

Increasingly, providers are using information technology in their practices, whether through an electronic medical record, e-prescribing, or some other electronic means. Through the use of available technology, patient's health information collected by one provider today may be used to communicate, electronically, to another provider taking care of the same patient tomorrow.

Electronic health records, e-prescribing and telehealth are clearly the most discussed when talking about broadband expansion in the health care system. One of the areas that is not discussed as often, but is growing rapidly both locally and nationally, is the health information network (HIN), a common platform for health information exchange between distinct entities. A streamlined version of the national HIN is the Direct Project, which aims to facilitate online, standards-based exchange of medical data between health care providers.[23]

Health information exchanges (HIEs) provide a common platform for data exchange between disparate entities. Nationally and at the local level, HIEs are emerging and demonstrating significant results. By moving HIE to the cloud, it is possible for organizations to collaborate with other providers and share data from multiple applications in a single online interface, cost effectively, eliminating the need for a central

data repository for a specific facility.[4]

At the state level, the West Virginia Health Information Network (WVHIN) launched a secure electronic health information system for the exchange of patient data among physicians, hospitals, diagnostic laboratories, and other care providers. Working with healthcare providers statewide, West Virginia Medicaid and the West Virginia Bureau for Public Health, the WVHIN's health information exchange (HIE) provides clinicians with a longitudinal patient history at the point of care by capturing clinical and administrative data from electronic medical records and healthcare claims.[24] Through the HIE, the provider has the ability to access clinical information, including lab results, diagnosis history, allergies, and patient visit history on more than 2.1 million patients and provides for the following:[25]

- Allows exchange of patient health information between hospitals, physicians, labs and other healthcare providers;
- Saves time and reduces administrative costs;
- Supports quality initiatives, including meaningful use;
- Connects directly to the Bureau for Public Health's Immunization Registry;
- Provides access to WVHIN's secure clinical messaging service, WVDirect;
- Is the gateway to WV e-Directive Registry, West Virginia's advance directive registry;[24] and,
- Has received Stage 2 Meaningful Use Certification whereby providers can satisfy Meaningful Use requirements by making a single connection to the WVHIN's HIE.

The WVHIN has made significant progress toward building a comprehensive and fully interoperable network while enabling the secure electronic exchange of patient health information that supports patient-centered care, increased efficiencies, and reduced costs within the healthcare system.[25]

Efforts have been underway to expand services to other health care providers and regions in the state. As of September 2013, the WVHIN had 9 hospitals and over 100 hospital-owned providers live on the health information exchange, and over 700 users exchanging medical data through WVDirect, WVHINs' secure messaging system. Recently, the WVHIN partnered with Monongalia General Hospital, Preston Memorial Hospital, Thomas Memorial Hospital, Grafton City Hospital and St. Mary's Medical Center, which are now "live" on WVHIN's query-based HIE; Wheeling Hospital and WVU Healthcare (Ruby Memorial, Berkeley Medical Center, Jefferson Medical Center and approximately 100 affiliated clinics and physician practices) joined the HIE last year.[26]

In an effort to improve the value of WVHIN and the HIE, the WVHIN partnered with Healtheway, which is a non-profit, public-private partnership to support eHealth Exchange, formerly known as the Nationwide Health Information Network. Although Healtheway has the goal of providing a nationwide HIE that provides data exchange and collaboration, the partnership will allow the exchange of more data with other organizations in the eHealth Exchange and will provide access to new interoperability technology through a trusted technology framework.[25]

In addition, the WVHIN has partnered with 10 other state health information exchange programs to enable the seamless exchange of health records via the DIRECT protocol. This partnership allows

WVDirect providers to send and receive health records to and from providers with a Direct address in other states.[25] The ability to connect providers, hospitals and health care centers within the state and between states will lead to greater care coordination, improved care and, ultimately, reduced costs.[24]

The Future of Technology in Patient-Centered Care

Healthcare reform and the HITECH Act have set the stage for health care organizations to implement a framework that promotes patient-centered care. Systems for doing so are being funded through federal in grants and incentives. In turn, technology is being adapted toward quality of care outcomes and pay for performance.[27]

These are exciting but challenging times for the healthcare industry. We are more technologically dependent than ever before. To keep pace, patient-centered organizations must utilize a wide variety of technologies that enable providers to interact with patients in meaningful ways and that meet the needs of the patient, all the while creating administrative and clinical efficiencies.[27]

mHealth

Mobile medical applications (mHealth) allow patients to download applications that may assist them with many of their medical conditions. For example, there are applications that provide dietary guidelines where food diaries can be kept; applications that allow the user to track glucose and heart rate; and applications that promote exercise, to name a few. Since the Food and Drug Administration (FDA) issued draft guidelines for mobile medical applications in mid-2011, mHealth applications have greater relevance for provider and patient use.[4]

Because of the flexibility and lower cost of mobile technology, many health care providers may explore using this technology for improving patient outcomes. The key for using these devices and applications is to connect patients and providers. Once connected, providers can enable predictive and preventive interventions. The technology is literally in the hands of the patient, and with healthcare professional support of mobile technology applications, a patient's health can be influenced and tracked.[4]

Mobile phone and M2M

A survey conducted by the Pew Research Center in 2011 showed that 83% of Americans own a cell phone, 35% own a smart phone, and 8% own a tablet. Among smart phone owners, one-quarter say their mobile phone is their primary source of internet connectivity.[28]

With the growth of mobile technology, mobile applications and mobile websites are quickly emerging, many allowing machine-to-machine (M2M) communications. Wireless devices are now able to talk to each other, opening up endless opportunities for innovation for health care and the health care provider. These include, but aren't limited to:

- Wireless heart rate monitors that can send data to the patient's mobile phone, which in turn transmits data back to the provider; if there is a problem, the provider can provide instruction immediately.

- When a patient forgets to take their medication at the appropriate time, the networked bottle can

trigger a text message or phone call to remind the patient to take the medication.

- Patients can use their mobile phones to record blood sugar levels or other data requested by the provider, allowing the provider to follow-up as needed; given the data input, an application can deliver suggestions about how the patient can make immediate changes.[4]

Healthcare organizations and providers are using internet websites and applications where patients can log in and view medical reports and test results, schedule appointments, and send secure emails to their providers. Other personalized web chats and text messaging offer additional opportunities for providers and patients to communicate in real time outside the physical walls of the medical office, and many of the West Virginia hospitals even use the internet and social media to communicate and teach patients about their care without having to leave their homes.[27]

Mobile and internet technologies are exciting tools for the health care industry and provide opportunities for providers to closely follow patient progress.

Patient Kiosks

Another up and coming program that providers are implementing is the front-office kiosks. Kiosks can engage patients through a series of intuitive touch screens; patients can provide health information, medical histories, communicate recent concerns, and ask questions, all before seeing the provider. In addition, the same technology can provide patients with health updates and educational materials tailored to their specific needs.[27]

Telemedicine

Telemedicine is another example of a patient-centered healthcare delivery method that is becoming more widely adopted within the industry. Video technology, internet connectivity, electronic health records (EHRs) and telephones work together to improve patients' access to care and allow providers to deliver healthcare regardless of geographic distance. It is a model of care that can reduce costs and increase the efficiency and expediency with which medical attention can be given.[27]

Telehealth supports clinical health care over long-distances for those in unserved or underserved areas, and may provide patient and professional health-related education, public health and health administration.[29]

Clinical uses of telehealth technologies may include, but are not limited to:

- Transmission of medical images for diagnosis and trauma treatment
- Groups or individuals exchanging health services or education live via videoconference
- Transmission of medical data for diagnosis or disease management
- Advice on prevention of diseases, patient monitoring and follow-up
- Health advice via telephone in emergent situations. [30]

Challenges for the Future

The Workgroup for Electronic Data Interchange (WEDI)

The Workgroup for Electronic Data Interchange (WEDI) is the leading authority on the use of Health IT for enhancing the quality of care, improving efficiencies and reducing costs of the American healthcare system through health information exchange.[31]

Formed in 1991 by the Secretary of Health and Human Services (HHS), WEDI was named as an advisor to HHS in the 1996 HIPAA legislation. WEDI, which is comprised of doctors, hospitals, health plans, laboratories, pharmacies, clearinghouses, dentists, vendors, government regulators and other industry stakeholders, continues to serve as a private and public industry solution to critical healthcare problems today.[31]

In 1993, the original WEDI report was created and provided a vision for the industry to successfully transition to electronic data interchange standards as a way to create cost-efficiencies and reduce the burden of administrative processes. The report led directly to the creation of administrative simplification provisions in the Health Insurance Portability and Accountability Act of 1996 (HIPAA).[31]

In December 2013, it is expected that WEDI will release a new report that seeks to provide solutions to advancing the transition to electronic healthcare. It is anticipated the next steps will include identifying major healthcare trends in the following four areas and developing goals that will become the roadmap for many years to come:

- Consumer engagement through improved access to their own health information
- Alternative payment models that improve the fee-for-service structure and provide better care at a lower cost; development of business, information, and exchange requirements
- Standards that will allow easier capture, link and exchange of administrative and clinical information
- Examples of innovative ways for providers and patients to interact using existing or emerging technologies in the healthcare industry.[32]

U.S. Department of Health and Human Services' Goals

The Department of Health and Human Services issued their agenda for improving care quality and reducing costs through HIT implementation for the coming year. These include:

- 50% of physician offices and 80% of eligible hospitals will receive meaningful use incentive payments;
- Interoperability will be emphasized;
- EHR access to personal health information by beneficiaries will be enhanced;
- Stage 2 Meaningful Use will be implemented; and,
- Program integrity will be ensured.[33]

Conclusion

Broadband deployment, health information technology and infrastructure investment over the years continues to improve and transform West Virginia's health care delivery system. Given all of the advancements, health care organizations and providers continue to explore technological opportunities that will improve the quality of patient care, meet all federal requirements, maximize reimbursement, and at the same time, reduce costs.

With the numerous incentives being offered for health information technology implementation and use of electronic health records and health information exchange, quality care and measurement reporting have also improved. With more options available, however, healthcare providers and organizations considering investments in health information technology must consider not only the availability and speed of broadband, but the appropriate and reliable technology solution that will affect the many ways they deliver health care now and in the future.

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