West Virginia Health Information Technology Infrastructure

Broadband Availability for Health Care Programs In West Virginia

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Broadband Infrastructure for Health Care Programs in West Virginia Existing Requirements, Capabilities and Unmet Need

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 one of the most important requirements for change in West Virginia's health care system. It is the conduit for enhanced and timely communication between doctors, doctors and patients, doctors and pharmacists and other health care providers. It facilitates the provision of medical care to un-served and under-served populations through remote diagnosis, treatment, monitoring, and consultations with specialists through telemedicine.[1] Rather than delaying treatment, broadband is the conduit for providers to communicate with other providers to facilitate health care interventions and well-timed 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 (ACA)

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 (ACA). One of the most significant requirements in the ACA 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) Act 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 $24.7 billion in incentive payments to hospitals and providers. As of June 2014, incentive payments have been made to 95% of hospitals nationally, up from 80% last year, and to 89% of physicians and health care providers, up from 58% last year, that have registered for the program.[8]

As of March 2014, West Virginia Medicaid had distributed $76.0 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   **WV Medicaid EHR Provider Incentive Payments**

	Total WV ELECTRONIC HEALTH RECORD PIP payments as of March 14, 2014					
	Hospital Count	Hospital Amount	EP* Count	EP Amount	Total Count	Total Amount Paid
2013	47	$38.4 million	815	$15.4 million	862	$53.8 million
2014	47	$51.7 million	1328	$24.3 million	1375	$76.0 million

*Eligible healthcare professionals [9]

As incentives are being paid, the data being gathered as a result of electronic health record implementation will be used to measure health care improvements by providers, 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 Corp. 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 WV counties through its telepsychiatric program. Between 2009 and 2013, 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. The telestroke program was developed to provide a video-based, neurological care program that will assist in the development of treatment strategies for patients who suffer a stroke. The program also provides the ability to share imaging scans and assists with information regarding 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 2012, 2013 and again in 2014,[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 in 2013.[15] In addition, WVU was also named as the "2014 Most Wired Advanced," which is indicative of a hospital with the following characteristics: stronger security systems and faster disaster recovery; electronic tools to improve business processes, quality and patient safety; use of evidenced-based electronic order sets; automated review of CMS key indicators with compliance alerts; chronic disease management services for patients at home; and more.[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 across the state. 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 the 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 Department of Health and Human Services, Office of the National Coordinator's (ONC) HealthIT Dashboard (Dec. 2013), 48% 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] up from 40% in 2012.

Table 2 below provides the electronic health record adoption rate by WV providers as noted from the
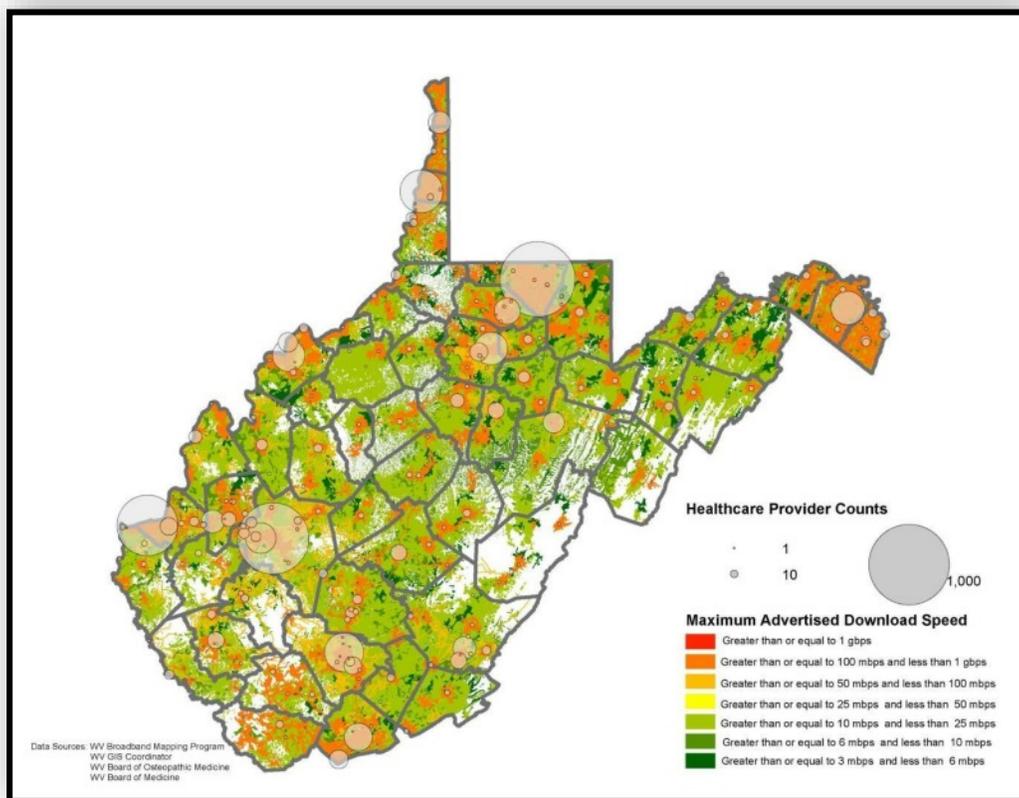
Table 2

ONC HealthIT Dashboard (Dec. 2013) EHR Adoption Rate by WV Providers (2013)

Adoption of EHRs	Primary Care Providers	Rural Hospitals	Small Hospitals	Total Pharmacies E-Prescribers Using Surescripts Network	Overall Office-Based Providers	Overall Hospitals
WV Rate	46%	44%	45%	98%	37%	47%
National Rate	53%	53%	53%	95%	48%	59%

HealthIT Dashboard. The rate of WV primary care providers who are adopting EHRs has slowed, up only 1% (to 46%) from the 2012 rate of 45%. Nationally, however, the adoption rate by primary care provider types is growing steadily, increasing from 44% to 53%[17] during the same period of time.

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 download speed for individual and group healthcare providers across West Virginia is depicted in **Figure 1**.

Figure 1   Advertised Broadband Download Speed and Access for WV Providers

Broadband availability has penetrated the majority of provider office locations, if not all. In previous years there was a lack of available services for doctors in the southern part of the state and along the eastern border. The most recent information shows that access to broadband has not only improved significantly in the areas previously lacking broadband services, but across the state as well.

In areas with service last year, speed has also improved. Areas previously with 3-10 mbps have increased to 10-25 mbps; those with 25-50 mbps have increased speeds to 50-100 mbps or greater since 2013.

The number of service providers has also increased over the same period of time. **Figure 2** shows the penetration of broadband service providers in last years' report as compared to the number of present service providers shown in **Figure 3.** The majority of the state last year had only one service provider,

whereas this year, the number of service providers has grown to 3-5 in much of the state.

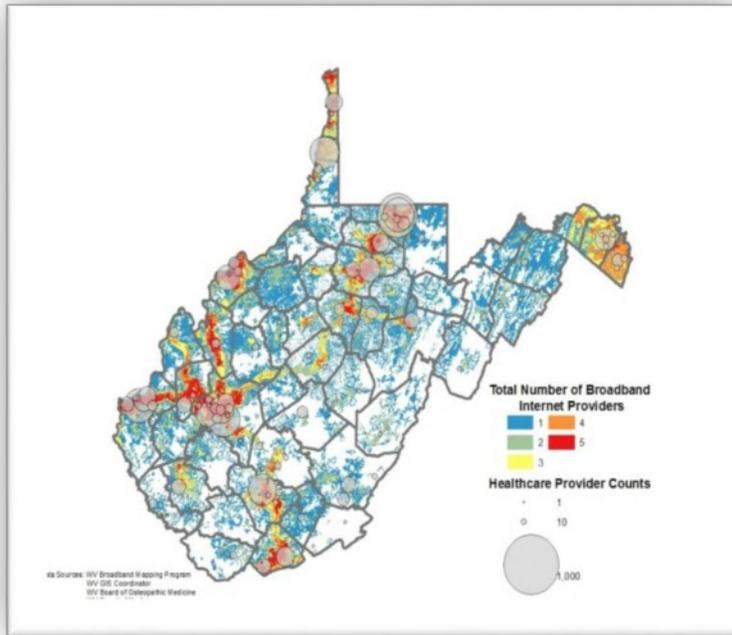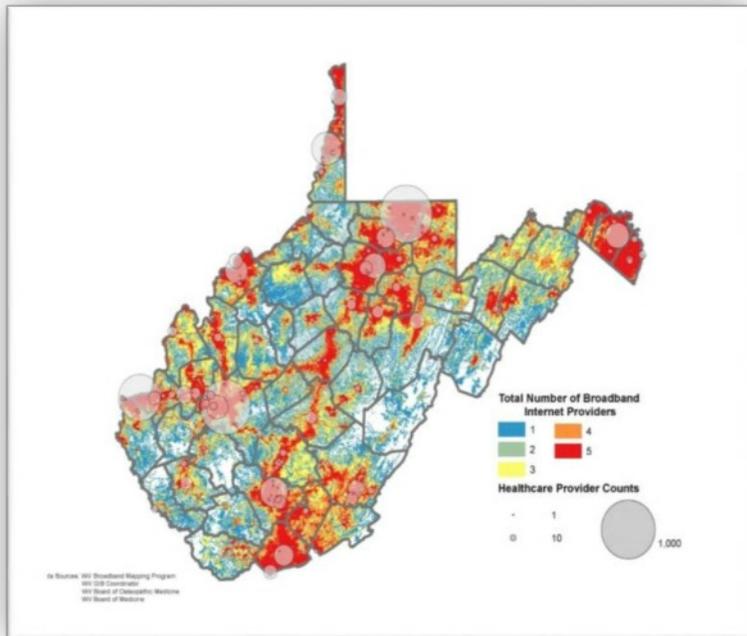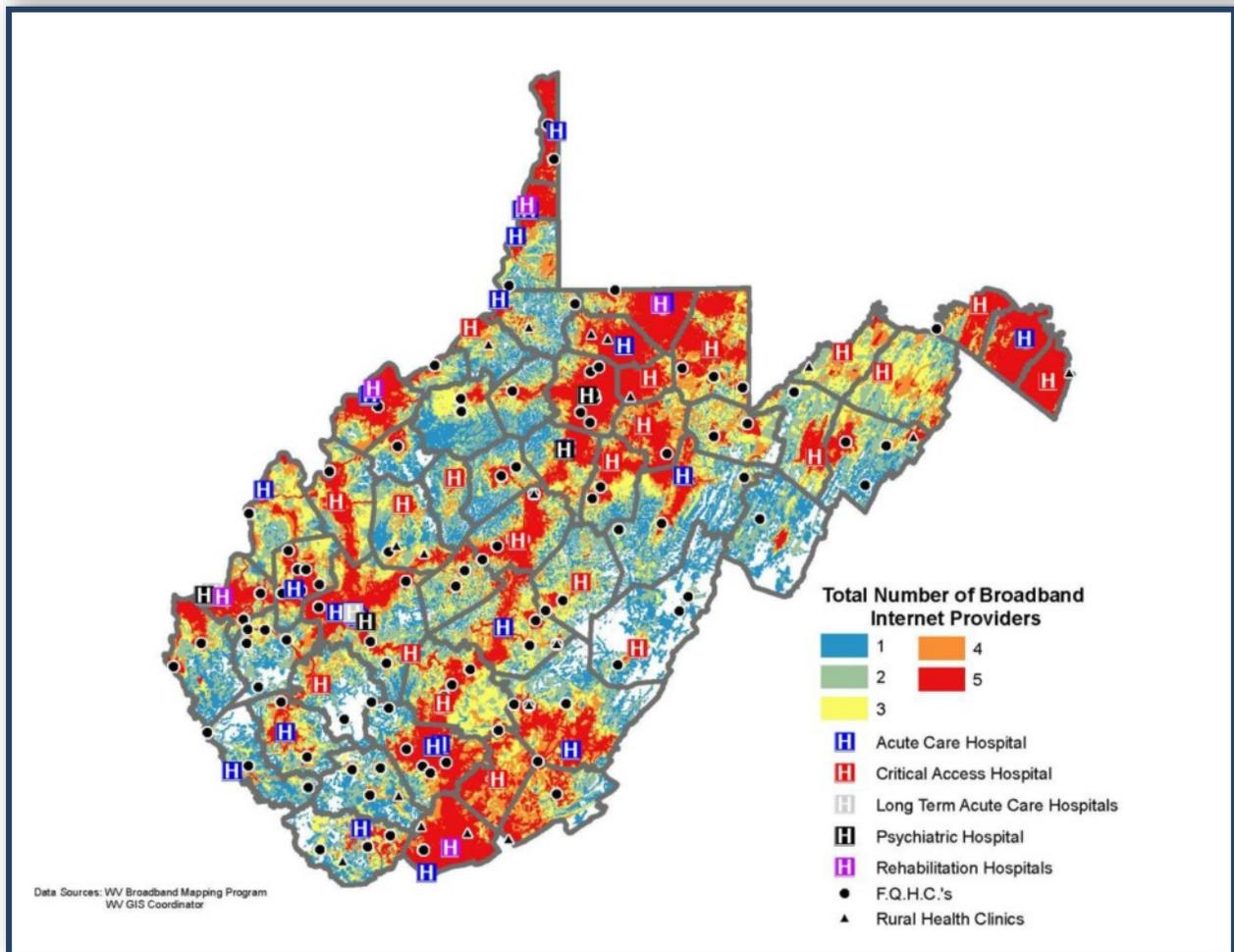**Figure 2**   **2013 Broadband Penetration by Number of Service Providers**

Figure 3   **2014 Broadband Penetration by Number of Service Providers**

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] which is shown in **Figure 4** below. Federally Qualified Health Centers in the southern and eastern part of the state that may not have had coverage in the past now show coverage by at least one service provider. All other parts of the state show broadband provider availability and access for health facilities statewide.

Figure 4

WV Facilities' Access to Broadband by Number of Internet Service Providers

Data Sources: WV Broadband Mapping Program
WV GIS Coordinator

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, 2013, Surescripts ranked WV 21st in the nation for e-prescribing performance, down from 18th 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 more than tripled between 2009 and 2013, and activated pharmacies are growing each year as well.
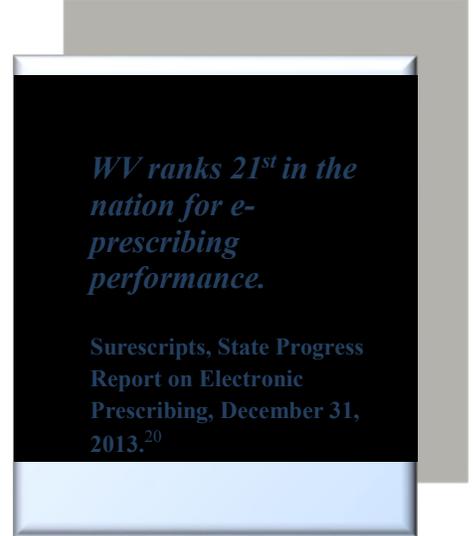
WV ranks 21st in the nation for e-prescribing performance.

Surescripts, State Progress Report on Electronic Prescribing, December 31, 2013.[20]

Table 3   **Adoption of E-Prescribing by West Virginia Providers**

	2009	2010	2011	2012	2013
Physicians Routing E-Prescriptions at Year End	946	1302	2014	2370	2933
Community Pharmacies Activated for E-Prescribing at Year-End	436	470	504	518	527

As shown in **Figure 5** and **Tables 3 and 4,**[20] providers in West Virginia are increasingly utilizing available information via electronic means for prescription benefit requests and for routing prescriptions electronically; however, utilizing information for identifying past and present prescription use prior to prescribing a particular medication and routing to a pharmacy electronically has fallen from 74% to 67% between 2012 and 2013.

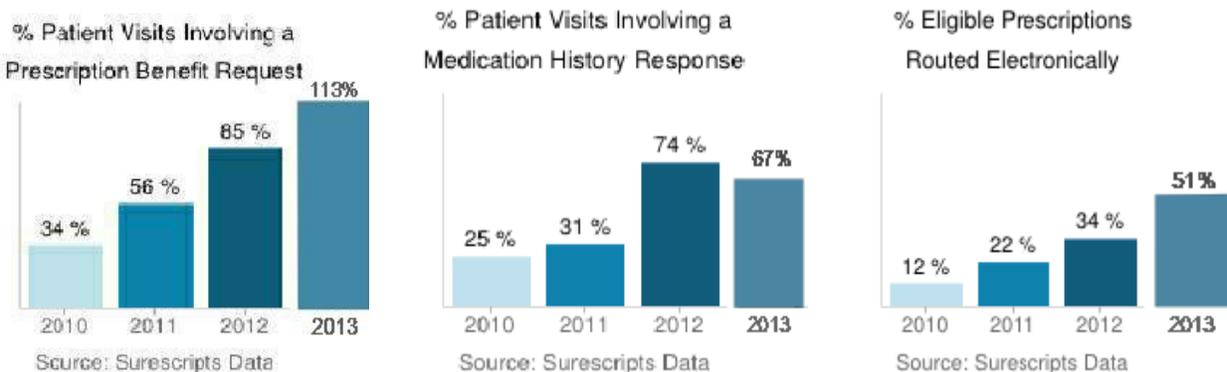**Figure 5**   **Use of Available Provider Information for E-Prescribing -- Percentages**

% Patient Visits Involving a Prescription Benefit Request
34% (2010), 56% (2011), 85% (2012), 113% (2013)
Source: Surescripts Data

% Patient Visits Involving a Medication History Response
25% (2010), 31% (2011), 74% (2012), 67% (2013)
Source: Surescripts Data

% Eligible Prescriptions Routed Electronically
12% (2010), 22% (2011), 34% (2012), 51% (2013)
Source: Surescripts Data

Table 4   Use of Available Provider Information for E-Prescribing – Total Numbers

E-Prescribing Utilization[20]	2009	2010	2011	2012	2013
Prescription Benefit Requests	1,219,781	3,252,778	3,463,649	7,135,267	9,736,973
Total Prescriptions Routed Electronically	1,055,556	1,618,580	3,237,822	5,033,512	7,570,751
Total Estimated Responses to Medication Requests	398,073	1,487,729	1,960,081	4,400,296	4,006,140

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 subject 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, a 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 data 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 cloud storage, 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.[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.[25]

The WVHIN:

- 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.[25]

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 August 2014, the WVHIN had 12 hospitals and over 100 hospital-owned providers "live" on the health information exchange, and over 1,100 users exchanging medical data through WVDirect, the WVHINs' secure messaging system. In regards to direct communication, the WVHIN connected 17 local health departments to WVDirect in 2014 as well. Recently, the WVHIN has welcomed Stonewall Jackson Memorial Hospital, Potomac Valley Hospital and Wetzel Community Hospital to the network. In 2013, the WVHIN welcomed Monongalia General Hospital, Preston Memorial Hospital, Thomas Memorial Hospital, Grafton City Hospital and St. Mary's Medical Center, to the 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 in 2012.[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 financed through federal funding both 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

It is expected that there will be some 500 million smartphone users worldwide using health care apps by 2015, and by 2018, half of the more than 3.4 billion smartphone and tablet users will have downloaded a mobile medical application (mHealth). Because of the expected number of users and the effect mobile medical applications may have on a user's health, the federal government is addressing the need for oversight through legislation and regulation.[28]

Simple mHealth apps allow patients to download programs that may assist them with many of their medical conditions. Examples of simple mobile applications may include the following:

- applications that provide dietary guidelines where food diaries can be kept,
- applications that allow the user to track glucose and heart rate,
- applications that promote exercise,
- applications where a networked bottle can trigger a text message or phone call to remind the patient to take the medication when a patient forgets to take their medication at the appropriate time, and
- applications used 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]

However, other mobile apps have the potential to transform healthcare by allowing doctors to diagnose patients with potentially life threatening conditions outside of the traditional health setting, help consumers manage their own health, and gain access to information when needed.[29]

For mHealth applications that have greater relevance for provider and patient use, the Food and Drug Administration (FDA) issued final guidelines for developers of mobile medical applications, or apps which are software programs that run on mobile communication devices and perform the same functions as traditional medical devices. The FDA is focusing its oversight on mobile medical apps that:

- are intended to be used as an accessory to a regulated medical device – for example, an application that allows a health care professional to make a specific diagnosis by viewing a

medical image from a picture archiving and communication system (PACS) on a smartphone or a mobile tablet; or

- transform a mobile platform into a regulated medical device – for example, an application that turns a smartphone into an electrocardiography (ECG) machine to detect abnormal heart rhythms or determine if a patient is experiencing a heart attack.[29]

Because of the flexibility and lower cost of mobile technology, many health care providers are exploring the use of technology for improving patient outcomes. More than 33% of physicians have recommended mobile health applications to their patients, according to a new survey by Manhattan Research. In addition to recommending health apps, the survey found that:

- 47% of physicians who owned smartphones used the devices to show patients videos or images,
- physicians are increasing their use of telemedicine and remote care devices,
- nearly 25% of physicians used secure patient portals to communicate with patients,
- 20% used secure messaging platforms to communicate with patients,
- 20% used remote patient monitoring, and
- 40% of physicians said that using digital technology to communicate with patients will boost patient outcomes.[30]

With the growth of mobile technology, mobile applications and mobile websites are quickly emerging, many allowing machine-to-machine (M2M) communications as well. Wireless devices are now able to talk to each other, opening up endless opportunities for innovation for health care and the health care provider. One example of wireless M2M communications is the 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.[4]

Another example is the artificial pancreas system. This new system provides a continuous glucose monitor and an insulin pump that are configured to work with a control algorithm running on the patient's iPhone. A monitor implanted underneath the skin evaluates patients' glucose levels and then shares those data with the mobile app. After calibrating the monitor with finger sticks and logging meals into the iPhone app, the data triggers the glucose monitor to automatically dispense insulin and a hormone called glucagon, both used to manage blood sugar levels. Researchers have found that the adult using the artificial pancreas system kept their glucose levels in an acceptable range 79% of the time, compared with only 58% of the time when using their routine insulin monitoring systems. Similarly, the adolescent group using the artificial pancreas system kept their glucose levels within an acceptable range 76% of the time, compared with 65% when using their usual care methods.[31]

Mobile and internet technologies are exciting tools for the health care industry and provide opportunities for providers to closely follow patient progress. The key for using these devices and applications is to connect patients and providers. Once connected, providers can enable predictive and preventive interventions.[4] 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.

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 un-served or under-served areas, and may provide patient and professional health-related education, public health and health administration as well.[32]

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

- Transmission of medical images for diagnosis and trauma
- Health service exchange between groups/individuals or live education 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. [33]

Although used in the past, telemedicine technologies are just beginning to be recognized for the benefits they provide hospitals, providers and consumers. On May 7, 2014, the Centers for Medicare and Medicaid Services issued a final rule for telemedicine, which reduced unnecessary, obsolete or overly burdensome Medicare regulations for hospitals and other providers. As a result, it is anticipated that health care providers will save an estimated $660 million annually and about $3.2 billion over five years under the final rule.[34] In addition, Medicare not only expanded coverage for telemedicine services, but also increased provider reimbursement payments for the services as well.[35]

As the benefits of telemedicine technologies are recognized, it is anticipated that more than seven million patients will use telemedicine services by 2018, compared with fewer than 350,000 in 2013, according to a report by IHS Technology. The report also found that revenue from telemedicine services is expected to increase from $440.6 million in 2013 to $4.5 billion in 2018.[36]

There are numerous studies where telemedicine technologies have improved patient outcomes. The following are only examples of services being studied or offered that have been proven effective in improving care outcomes:

- implantable heart rhythm devices that automatically send vital cardiac readings to a telemonitoring center[37, 38]
- telemedicine booths with cameras that can pan, tilt and zoom to diagnose and treat athletes, determine potential injury and return to play [39]
- nursing homes offering after-hours telemedicine services show significant reductions in hospitalization rates and hundreds of thousands of dollars in savings.[40]

One study on telemedicine services was conducted by one of our own in the Mountain State, Marshall University. Researchers conducted a review of 55 scholarly articles and case studies published in the U.S.

between 2003 and 2013 that examined the effects of telemedicine tools in ICUs. They found that the benefit of telemedicine technology for significantly reducing the length of stay, patient mortality rates and total cost of the ICU stays far outweighed the cost of adopting telemedicine technology. Specifically, the researchers reported that telemedicine adoption showed the following:

- a 24% decrease in a patients' length of stay;
- 26% of patients were more likely to survive their ICU care than those treated at a standard ICU; and
- 16% of patients were more likely to survive their hospitalization than those at standard ICUs.[41]

Telemedicine is increasingly becoming a strategy for states when dealing with provider shortages and health care delivery issues, and as a mechanism for ensuring access to specialty care, particularly in the rural areas.[42]

On September 8, 2014, the American Telemedicine Association issued two reports that focused on identifying state policy gaps in telemedicine coverage, reimbursement, physician practice and licensure. States were graded and compared via a report card with grades ranging from A-F.[42]

The first report focused on one of the biggest challenges to telemedicine adoption: coverage and reimbursement. Although Medicare has recently expanded coverage and increased provider reimbursement payments for telemedicine services,[34, 35] patients and providers continue to encounter an assortment of insurance requirements and payment streams that may not be conducive in making the telemedicine investment. The report has captured the landscape complexity between states by grading them on two categories, health plan parity and Medicaid conditions of payment, and measuring those categories using 13 indicators related to coverage and reimbursement. Although West Virginia received an overall composite grade of "C," it failed in the areas of parity, eligible technology, eligible providers, and use in rehabilitation and home health. **Figure 6** shows the results of West Virginia's report card related to coverage and reimbursement of telemedicine services.[42]

The second report focused on professional licensure portability and practice standards for providers using telemedicine, another challenge for health care providers considering telemedicine adoption. This report extracts and compares physician practice standards for telemedicine for every state in the U.S and assigns a grade as in the first report; the grade is indicative of existing policy barriers that inhibit the use of telemedicine that would enable patient and provider choice to quality healthcare services.[43]

Although much discussion has centered on coverage and reimbursement of telemedicine, health care providers are encountering conflicting and sometimes confusing policies from their own colleagues. Over the years states have revised health professional standards and licensure requirements for telemedicine with varied results. Some states have created new laws that impact access to care via telemedicine, while others have amended existing policies.[43]

Some medical boards are adopting practice standards with higher specifications for telemedicine than in-person care. Unless Boards direct the complexities surrounding telemedicine services, providers are left to navigate state medical practice laws or risk punitive action. Specifically, boards must consider:

- legal guidelines requiring an initial examination be conducted in-person and a physician-patient

relationship be established in-person
- requirements for a telepresenter
- in-person follow up exam, and
- patient informed consent.[43]

Figure 6 **WV's Telemedicine Coverage and Reimbursement Report Card**

Telemedicine in West Virginia[42]		
PARITY:		
Private Insurance	F	
Medicaid	F	
State Employee Health Plan	F	
MEDICAID SERVICE COVERAGE & CONDITIONS OF PAYMENT:		
Patient Setting	C	
Eligible Technologies	F	
Distance or Geography Restrictions	C	
Eligible Providers	F	
Physician-provided Services	B	
Mental/behavioral Health Service	B	
Rehabilitation	F	
Home Health	F	
Informed Consent	B	
Telepresenter	B	
INNOVATIVE PAYMENT OR SERVICE DELIVERY		
State-wide Network		
Medicaid Managed Care	✔	
Medicare-Medicaid Dual Eligibles		
HCBS Waiver		
Corrections		
Corrections		
Other		

- WV is bordered by 2 states with private insurance parity laws: Kentucky and Virginia. WV introduced parity legislation in 2014 which included coverage for RPM and store-and-forward, and placed no limits on the patient setting or eligible telemedicine distant site providers. The bill died in committee.

Medicaid

- Coverage is limited to originating sites located in non-metropolitan professional shortage areas.
- Coverage for interactive audio-video only.
- Managed care plan covers weight management services including preventative medicine counseling and individual and group exercise classes with nutritional counseling. Only state to allow exercise physiologists and certified trainers as eligible distant site providers.
- Requires telepresenter on patient site premises and unspecified form of consent only for behavioral health services.

The ability for health care providers to practice out-of-state using one license, or licensure portability, is an issue for health care providers when providing any service. Most states require that a physician is licensed in the state where their patient is located. In many instances, state-by-state approaches prevent people from receiving critical, often life-saving medical services that may be available to their neighbors living just across the state line.[43]

Based upon the issues described above, the report focused on two categories, physician practice standards and licensure. Four indicators were measured: physician-patient encounter, telepresenter, informed consent and licensure and out-of-state practice. West Virginia performed better in the physician practice standards and licensure as compared to coverage and reimbursement. In all areas, West Virginia earned an "A," except in the area of licensure and out-of-state practice where a grade of "C" was earned. **Figure 7** shows the information particular to West Virginia and provides the detailed report card.[43]

Figure 7

WV's Telemedicine Physician Licensure Portability and Practice Standards Report Card

Telemedicine in West Virginia[43]		
PHYSICIAN PRACTICE STANDARDS & LICENSURE:		
Physician-patient encounter	A	• Requirements for telemedicine are on par with requirements for in-person services, not including prescribing. No unique practice standard requirements for telemedicine.
Telepresenter	A	
Informed Consent	A	
Licensure & Out-of-State Practice	C	• Requires full license and allows P2P exemption.
POLICY OR STATEMENT ON INTERNET PRESCRIBING:	✔	

In the fast paced world of technology, telemedicine is changing the business of medical care delivery. Telemedicine services are quickly becoming a means for reducing costs associated with medical care administration, chronic disease management and access to specialty care in remote areas. Roeen Roashan, a medical devices and digital health analyst at IHS Technology, articulated how the environment is ripe for change in health care when he said: "Amid rising expenses, an aging population and the increasing prevalence of chronic diseases, the health care industry must change the way it operates." He added that telemedicine "represents an attractive solution to these challenges."[36]

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.[44]

Formed in 1991 by the Secretary of Health and Human Services (HHS), WEDI was named as an advisor to HHS in the 1996 Health Insurance Portability and Accountability Act of 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.[44]

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 HIPAA.[44]

In December 2013, WEDI released a new report that seeks to serve as the roadmap for health information technology. 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:

- **Patient Engagement:** Consumer engagement through improved access to pertinent healthcare information

- **Payment Models**: Business, information, and data exchange requirements that will enable payment models as they emerge

- **Data Harmonization and Exchange**: Alignment of administrative and clinical information capture, linkage, and exchange

- **Innovative Encounter Models**: Business and use cases for innovative encounter models that use existing and emergent technologies.[45]

Department of Health and Human Services' Goals

The Department of Health and Human Services continues to implement programs that meet their agenda for improved care quality and cost reductions through HIT implementation. 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.[46]

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 technology solution that will affect the many ways they deliver health care now and in the future.

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