



# REPORT TO CONGRESS

OCTOBER 2014

UPDATE ON THE ADOPTION OF HEALTH INFORMATION TECHNOLOGY AND RELATED EFFORTS TO FACILITATE THE ELECTRONIC USE AND EXCHANGE OF HEALTH INFORMATION



*This annual report is submitted pursuant to  
Section 3001(c)(6) of the Public Health Service Act*

**Prepared by:**

The Office of the National Coordinator for Health Information Technology (ONC)  
Office of the Secretary, United States Department of Health and Human Services  
<http://healthit.gov/>



Submitted to:

The Honorable Jack Kingston, Chairman, Subcommittee on Labor, Health and Human Services, Education and Related Agencies, Committee on Appropriations

The Honorable Rosa DeLauro, Ranking Member, Subcommittee on Labor, Health and Human Services, Education and Related Agencies, Committee on Appropriations

The Honorable Dave Camp, Chairman, Committee on Ways and Means

The Honorable Sander Levin, Ranking Member, Committee on Ways and Means

The Honorable Fred Upton, Chairman, Committee on Energy and Commerce

The Honorable Henry Waxman, Ranking Member, Committee on Energy and Commerce

The Honorable Ron Wyden, Chairman, Committee on Finance

The Honorable Orrin G. Hatch, Ranking Member, Committee on Finance

The Honorable Tom Harkin, Chairman, Committee on Health, Education, Labor, and Pensions

The Honorable Lamar Alexander, Ranking Member, Committee on Health, Education, Labor, and Pensions

The Honorable Harold Rogers, Chairman, Committee on Appropriations

The Honorable Nita M. Lowey, Ranking Member, Committee on Appropriations

The Honorable John D. Rockefeller, Chairman, Committee on Commerce, Science, and Transportation

The Honorable John Thune, Ranking Member, Committee on Commerce, Science, and Transportation

The Honorable Barbara Mikulski, Chairwoman, Committee on Appropriations

The Honorable Richard Shelby, Ranking Member, Committee on Appropriations

The Honorable Tom Harkin, Chairman, Subcommittee on Labor, Health and Human Services, Education, and Related Agencies

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The Honorable Lamar Smith, Chairman, Committee on Science, Space, and Technology

The Honorable Eddie Bernice Johnson, Ranking Member, Committee on Science, Space, and Technology

The Honorable Bill Nelson, Chairman, Special Committee on Aging

The Honorable Susan M. Collins, Ranking Member, Special Committee on Aging



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## STATUTORY REQUIREMENT

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Section 13113(a) of the American Recovery and Reinvestment Act of 2009 under Title XIII of Division A, part of the Health Information Technology for Economic and Clinical Health (HITECH) Act:

(a) REPORT ON ADOPTION OF NATIONWIDE SYSTEM.—Not later than 2 years after the date of the enactment of this Act and annually thereafter, the Secretary of Health and Human Services shall submit to the appropriate committees of jurisdiction of the House of Representatives and the Senate a report that—

1. Describes the specific actions that have been taken by the federal government and private entities to facilitate the adoption of a nationwide system for the electronic use and exchange of health information
2. Describes barriers to the adoption of such a nationwide system
3. Contains recommendations to achieve full implementation of such a nationwide system

The Secretary of Health and Human Services submitted the first report required by section 13113(a) on January 17, 2012 and then a subsequent report on June 21, 2013. This report is the annual update to the previous submissions.



# EXECUTIVE SUMMARY

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## Context

Information is the lifeblood of medicine, and improving the availability and uses of health information is foundational for enhancing the modern health care system's efficiency and effectiveness. Today, networks of health care providers offering specific services (e.g., labs, pharmacies, public health agencies) and consumer-centric technologies that promote wellness and self-care activities generate valuable health data. These data create the potential for better informed decisions and processes that can simultaneously improve individual health and the health care delivery system.

Emergent and existing health information technologies (health IT) that are interoperable and capable of integrating wide stores of variously formatted data from different sources is a critical component to attain information-fueled health system improvements. Once interoperable, health data and health IT systems provide a platform for accelerated improvements in the health care system; improvements that will put data to better use by making it available at the right time, to the right people, and in the right format.

At the turn of the 21<sup>st</sup> century, adoption of electronic health records (EHRs) among physicians and hospitals was just beginning and moving slowly. To accelerate the adoption and use of health IT, Congress passed and President Obama signed into law the Health Information Technology for Economic and Clinical Health (HITECH) Act as part of the American Recovery and Reinvestment Act (ARRA) of 2009. The HITECH Act authorized the Centers for Medicare & Medicaid Services (CMS) to provide financial incentives to eligible hospitals, Critical Access Hospitals (CAHs), and eligible professionals to adopt and meaningfully use certified EHR technology to improve patient care. The HITECH Act also authorized the Office of the National Coordinator for Health Information Technology (ONC) to establish and administer programs to guide federal actions to accelerate adoption by physicians, hospitals, and other key entities and assist them to meaningfully use certified EHR technology.

## Evidence of Progress toward Adoption of a Nationwide System

In the past decade, the health IT infrastructure across the country has grown to become more resilient and flexible. EHR adoption among hospitals and physicians has grown substantially since the passage of HITECH. In 2013, 59 percent of hospitals and 48 percent of physicians had at least a basic EHR system, respective increases of 47 percentage points and 26 percentage points since 2009, the year the HITECH Act was signed into law. Moreover, there is widespread participation among eligible hospitals and professionals in the CMS EHR Incentive Programs (EHR Incentive Programs). As of June 2014, 75 percent (403,000+) of the nation's eligible professionals and 92 percent (4,500+) of eligible hospitals and CAHs had received incentive payments.

## Key Barriers

This progress has laid a strong base for health IT adoption and created a growing demand for its interoperability that not only supports the care continuum, but also supports health generally. Despite progress in establishing standards and services to support health information exchange and interoperability, practice patterns have not changed to the point that health care providers share patient health information electronically across organizational, vendor, and geographic boundaries. Electronic health information is not yet sufficiently standardized to allow seamless interoperability, as it is still inconsistently expressed through technical and medical vocabulary, structure, and format, thereby limiting the potential uses of the information to improve health and care. Patient electronic health information needs to be available for appropriate use in solving major challenges, such as providing more effective care and informing and accelerating scientific research.

Additionally, health IT adoption remains a lower priority among providers that are not eligible for incentive payments under the EHR Incentive Programs, such as long-term care, post-acute care, and behavioral health settings. Effective communication and information sharing across all health care providers is essential for improving care quality and community health. Better alignment of health IT solutions among all provider types could promote electronic exchange and care coordination activities among all providers.

## Key Actions

The following sections present key developments related to HHS's role to foster a strong and flexible nationwide health IT infrastructure that supports a more effective and efficient health care system. Key HHS actions include:

- ❖ Supporting EHR adoption among health care providers across the health care system.
- ❖ Promoting existing technical standards and developing new standards critical to the development and success of an operational and connected health system.
- ❖ Increasing the number of health IT workforce professionals that can facilitate the implementation and support of an electronic health care system.
- ❖ Facilitating interoperability between public health agencies and health care providers.
- ❖ Supporting, advising and collaborating with states and communities to drive local health care solutions.
- ❖ Sharing studies and recommendations with providers, payers and patients on how health IT improves health care quality and patient safety.
- ❖ Empowering individuals to access and use their health information to stay informed and improve their health and well-being.

# PROGRESS ON ADOPTION OF HEALTH IT

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## BACKGROUND

EHRs can facilitate the collection, storage, and sharing of comprehensive real-time information for health care providers to make informed decisions with their patients. EHR data can be created, managed, and accessed by authorized providers and staff across health care organizations. Furthermore, EHRs can integrate information from current and past health care providers and emergency facilities, as well as assemble clinical information from school and workplace clinics, pharmacies, laboratories, patient-generated health data, and medical imaging facilities. Evidence of EHR usage's benefits continue to grow,<sup>1</sup> and can include:

- ❖ Providing individuals and health care providers with access to medical history, diagnoses, medications, immunization dates, allergies, radiology images, and laboratory test results at the point of care.
- ❖ Offering access to evidence-based tools that providers can use in making decisions about a patient's care.
- ❖ Automating and streamlining providers' workflow.
- ❖ Increasing organization, accuracy, and use of patient information.
- ❖ Reducing unnecessary tests and procedures.
- ❖ Preventing medical errors.
- ❖ Repurposing of data for regulated clinical research.
- ❖ Identifying safety problems and quickly finding and notifying patients who may be at risk for problems related to unsafe drugs or medical devices.

In addition to improving an individual's care, EHRs can help improve population health. EHRs can serve as a tool for the medical community to find unexpected increases in diseases within a community, enabling health officials to take action sooner to protect the public. Communities have also used EHRs for medical disaster response and recovery.

Prior to the HITECH Act, adoption of EHRs among physicians and hospitals was quite low. In 2009, roughly one-half (48 percent) of office-based physicians had any type of EHR system. When examining the adoption of EHRs containing functionalities, such as the ability to generate a comprehensive list of patients' medications and allergies and the ability to view laboratory or imaging results electronically, only 22 percent of office-based physicians had a basic EHR system. U.S. hospitals had similar adoption rates. In 2009, only 12 percent of hospitals had adopted a basic EHR system. The next section shows growth in EHR adoption among office-based physicians, non-federal acute care hospitals, and federally-qualified health centers.

## EVIDENCE OF PROGRESS ON ADOPTION OF A NATIONWIDE SYSTEM

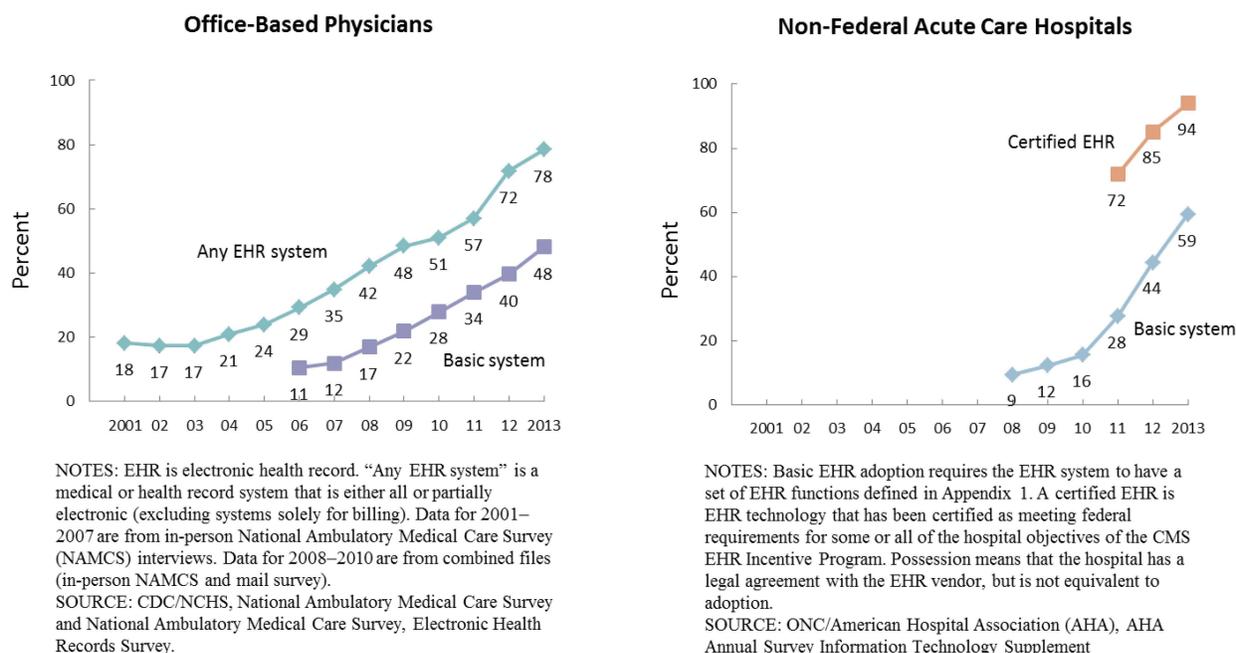
### Measures of EHR Adoption

**Any EHR system:** Obtained from "yes" responses to the question, "Does this practice use EHRs (not including billing records)?"

**Basic EHR:** A term created by an expert panel prior to the EHR Incentive Programs to describe systems that contain core functionalities. There is not a 1:1 match for functionalities defined as "basic" and functionalities required under the EHR Incentive Programs. More detail on the specific functionalities is included in Appendix 1.

**Certified EHR:** Obtained from "yes" responses to the question, "Do you possess an EHR system that has been certified as meeting federal requirements for the hospital objectives of Meaningful Use?"

Figure 1. Adoption of EHRs among office-based physicians and non-federal acute care hospitals.



### Physician Adoption of EHR Technology

Results from a 2013 nationally representative survey of office-based physicians<sup>2</sup> indicate that:

- ❖ More than three-quarters (78 percent) used any type of EHR system, up from 18 percent in 2001.
- ❖ About one-half (48 percent) reported having a system that met the criteria for a basic EHR system, up from 11 percent in 2006.
- ❖ When limited to primary care physicians, more than one-half (53 percent) of such office-based physicians reported having a system that meets the criteria for a basic EHR system.

## ***Hospital Adoption of EHR Technology***

Results from nationally representative surveys of non-federal acute care hospitals<sup>3</sup> and Critical Access Hospitals<sup>4</sup> indicate that:

- ❖ Hospital adoption of at least a basic EHR system more than quadrupled since 2009, from 12 percent to 59 percent.
- ❖ Hospitals possessing certified EHR technology increased by 30 percent between 2011 and 2013, rising from 72 percent to 94 percent.
- ❖ In 2013, 89 percent of CAHs used an EHR system, and 49 percent of CAHs planned to upgrade/install a new EHR within one year.

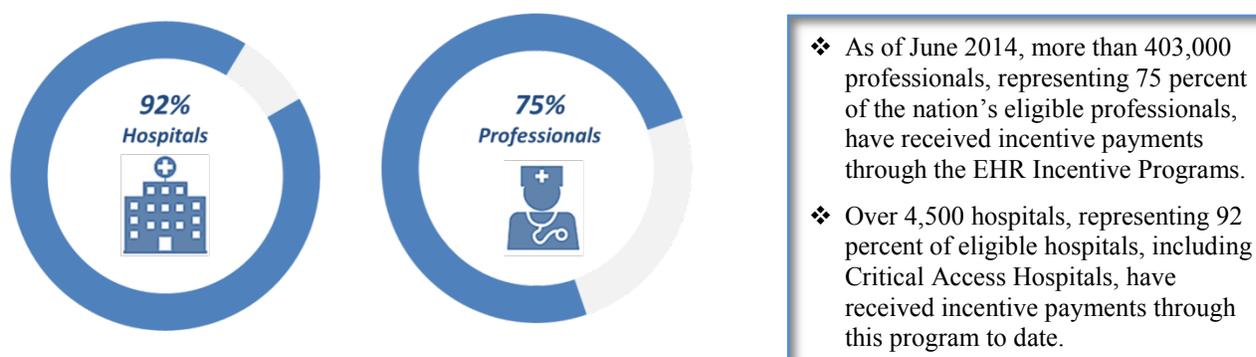
## ***Adoption of EHR Technology Among Federally-Qualified Health Centers***

- ❖ In 2012, nine out of ten (90 percent) health centers had adopted an EHR system, and half had adopted EHRs with basic capabilities.<sup>5</sup>

## ***Medicare and Medicaid EHR Incentive Programs***

The HITECH Act established the EHR Incentive Programs to provide financial incentives for the adoption and meaningful use of certified EHR technology to improve patient care. CMS implemented the EHR Incentive Programs through notice and comment rulemaking and created the necessary infrastructure to implement the program in accordance with existing Medicare and Medicaid payment policies and statutory program eligibility criteria. CMS regulations define the objectives and associated measures of meaningful use, as well as other requirements that eligible professionals, eligible hospitals, and CAHs must meet in order to receive an incentive payment.<sup>6</sup> In addition to being able to earn the incentive payments for demonstrating meaningful use in the initial years of the program, eligible professionals, eligible hospitals, and CAHs failing to demonstrate meaningful use of certified EHR technology may be subject to payment adjustments under Medicare beginning in 2015.

**Figure 2. Eligible hospitals and professionals paid under the EHR Incentive Programs.**



SOURCE: CMS EHR Incentive Program data, June 2014

Both the incentives and payment adjustments greatly affect physicians' decisions to adopt EHRs. A 2011 survey of physicians found that the EHR Incentive Programs' payment or the proposed financial penalties is the top factor having a major influence on the decision to adopt an EHR. Seven in ten (71 percent) of non-adopters reported that either proposed financial penalties or payments under the EHR Incentive Programs would be a major influence on their decision to adopt an EHR system.<sup>7</sup>

Additionally, twenty-six hospitals operated by the Indian Health Service (IHS) have received a total of \$35 million from the EHR Incentive Programs, and an additional 14 Tribal hospitals using the IHS Resource and Patient Management System have received \$17.8 million.

### ***Health IT Certification Program***

Under the HITECH Act, ONC, in consultation with the National Institute of Standards and Technology (NIST), recognizes and administers the ONC Health IT Certification Program (Health IT Certification Program) for the voluntary certification of health IT as being in compliance with applicable certification criteria that has been adopted under HITECH. Such program includes, as appropriate, the testing of health IT. Through rulemaking, the Secretary adopts the technical standards and criteria for certified EHR technology, with input from two Federal Advisory Committees and recommendations from the National Coordinator for Health Information Technology (National Coordinator). Health IT vendors then voluntarily submit their health IT products to be certified and tested under the Health IT Certification Program. In order to receive incentive payments under the EHR Incentive Programs, eligible professionals and hospitals must adopt, implement, upgrade, or demonstrate meaningful use of certified EHR technology in ways defined by CMS. As of April 2014, there were 1,136 certified products.

## EVIDENCE OF BARRIERS TO EHR ADOPTION

### *Barriers Among Physician EHR Adopters and Non-Adopters*

In March 2014, ONC and the Centers for Diseases Control and Prevention (CDC) released research comparing the perspectives of physicians with and without EHRs. Controlling for physician and practice characteristics, the study concluded that a significantly higher proportion of non-adopters perceived 11 of the 12 barriers as “major barriers” to EHR adoption. Access to high-speed internet was the least cited major barrier to EHR adoption.<sup>8</sup>

**Table 1. Office-Based Physicians’ Top 5 “Major Barriers” to EHR Adoption.**

<i>Among EHR adopters</i>	<i>Non-adopters</i>
1. Cost of purchasing a system (52%)	1. Cost of purchasing system (73%)
2. Loss of productivity (37%)	2. Loss of productivity (59%)
3. Annual maintenance cost (27%)	3. Annual maintenance costs (46%)
4. Adequacy of training (27%)	4. Finding EHR to meet practice needs (46%)
5. Finding EHR to meet practice needs (25%)	5. Adequacy of training (40%)

### *EHR Adoption Among Providers Ineligible for CMS EHR Incentive Programs*

Under the statute, only certain types of health care providers are eligible for the EHR Incentive Programs. Appendix Table 2 and Appendix Table 3 highlight providers eligible and ineligible for payments. Among those ineligible are long-term care, post-acute care, and behavioral health facilities although eligible professionals who practice in those settings may be eligible for the program. The *EHR Payment Incentives for Providers Ineligible for Payment Incentives and Other Funding Study* includes adoption rates for different provider types not eligible for the EHR Incentive Programs.<sup>9</sup>

- ❖ A national study of residential care facilities conducted in 2012, which includes personal care homes, adult care homes, board and care homes, and adult foster care found that one in five (20 percent) used EHRs.<sup>10, i</sup>
- ❖ A recent national survey of community-based behavioral health care providers found that approximately 65 percent use an EHR at one or more of their sites; one-fifth (21 percent) indicate using an EHR across sites, and 2 percent of all respondents reported the ability to meet all meaningful use requirements by the end of 2011. One-third (35 percent) use a combination of paper/electronic across sites.<sup>11</sup>

<sup>i</sup> Due to limited research into EHR adoption among these provider types, the estimates of EHR adoption are not parallel to official HHS measures for hospitals and office-based providers

## FEDERAL GOVERNMENT ACTIONS TO REDUCE BARRIERS AND ENCOURAGE EHR ADOPTION

### *Assistance and Support for Building a Health IT Infrastructure*

#### *Regional Extension Center Program*

Section 3012 of the HITECH Act directed ONC to establish the Regional Extension Center (REC) program. ONC designed the nationwide program to leverage local expertise to provide practical, customized support to meet the needs of providers to adopt and meaningfully use EHRs. The REC program supports EHR adoption and meaningful use among providers that historically have lower rates of EHR adoption, such as small practices, community health centers, and rural and public hospitals.

- ❖ As of June 2014, RECs assist over 150,000 providers, of which over 136,000 are now live on an EHR, and over 100,000 have achieved meaningful use through the EHR Incentive Programs.
- ❖ RECs are partnered with over 46 percent of all primary care providers in the nation, 54 percent of all rural providers, 83 percent of all community health centers, and 80 percent of all Critical Access Hospitals.
- ❖ An October 2013 Government Accountability Office (GAO) report found that Medicare providers working with RECs were nearly twice as likely to receive Medicare EHR Incentive Payments as those that do not.<sup>12</sup>

ONC leverages the situational awareness provided by the RECs to assess and respond to key challenges providers experience in achieving meaningful use. For example, ONC and the RECs developed a variety of technical and educational tools that the RECs tested in the field. Additionally, the RECs partnered with two EHR developers demonstrating high market shares with CAHs and rural health clinics in their region to develop product-specific toolkits to provide a meaningful use implementation path for these facilities.<sup>13</sup> ONC uses this information to provide technical assistance through the REC program as well as inform policy and programmatic decisions.

While the initial REC program period was scheduled to conclude in 2014, RECs are now eligible for a no-cost extension, to not exceed one year. Extending the period of performance enables the RECs to assist approximately 20,000 more providers to achieve meaningful use beyond the current 100,000 provider goal. Collectively, the RECs will assist at least 10,000 specialists and primary care providers not eligible for the EHR Incentive Programs, such as nurse practitioners, physician assistants, and other providers from certain specialty settings. The program ends August 2015.

#### *Health IT Workforce Training*

The availability of a skilled workforce that can facilitate the implementation and support of an electronic health care system is critical for health IT to drive substantial improvements in care, efficiency, and

population health. In 2009, ONC estimated a shortfall of 51,000 health IT workers over five years to meet the needs of health care providers and facilities in the adoption of EHRs. Under the HITECH Act, ONC allocated \$118 million in assistance to institutions of higher education to establish health informatics education programs, publicly available curriculum, and competency exams. The ONC Workforce Programs ended in 2014, after collectively training 21,437 students and administering close to 10,000 competency-based exams. A program evaluation conducted by independent contractors reporting to ONC in 2014 found that students enrolled in these grant programs were more likely to be employed in health IT than they had been prior to their participation.<sup>14</sup>

In 2013, the Health Resources and Services Administration (HRSA) launched the Rural Health IT Workforce program to train health IT workforce for employment in rural hospitals and clinics, with the goal of helping these hospitals and health clinics maintain health IT systems, such as EHRs, telehealth, home monitoring, mobile health technology, and meet the EHR Incentive Programs' requirements. HRSA awarded close to \$4.4 million in grants to rural organizations in fifteen states. Each program is making their training curriculum available online so other rural-serving community colleges can replicate these programs.

#### *Support to Rural Communities*

Although EHR adoption among rural hospitals has increased substantially in recent years,<sup>15</sup> concerns remain regarding the unique challenges they face in adopting and achieving meaningful use of certified EHR technology. These challenges include resource constraints and EHR implementation costs, availability of grants and loans to support EHR implementation, and workflow challenges.

From 2011-2014, HRSA's Office of Rural Health Policy awarded one-time funding of \$12 million to 41 grantees for the Rural Health IT Network Development Program to enhance health care delivery in rural America. The activities supported by this grant program include: workflow analysis, EHR strategic plan development, EHR training, purchase of health IT equipment, identifying and locating certified health IT equipment vendors, and installation of broadband.

#### *Supporting Veterans in Rural Areas*

HHS and Veterans Affairs (VA) supported 10 pilot projects to help rural veterans gain access to their health information stored in the VA system and then transmit this health information to their local non-VA health care provider to enhance care coordination.

Additionally, HRSA awarded a total of \$900,000 to Maine, Montana, and Alaska to improve the quality of mental health and other critical health care services for veterans living in rural areas. These services will enable health providers to coordinate care wirelessly and electronically across long distances to detect and treat post-traumatic stress disorders, traumatic brain injury, and other injuries for rural veterans.

Federal agencies collaborate to support health IT initiatives to improve health and health care in rural areas. In 2013, HHS and the U.S. Department of Agriculture (USDA) launched a pilot project to expand access to capital to support health IT adoption in five states. Through this work, hospitals were able to compete for more than \$38 million in funding from the USDA.

### *Expanding Telehealth Technology*

Telehealth technology expands health care delivery and offers important opportunities to improve care coordination in communities by linking health care providers with specialists and other experts not available locally, thereby increasing access and health care quality. The Telehealth Network Grant Program, a key HRSA program focused on expanding the reach of telehealth, funds projects demonstrating the use of telehealth networks to improve health care services for medically underserved populations in rural and frontier communities. This program seeks to help communities build the human, technical, and financial capacity to develop sustainable telehealth programs and networks. As of 2011, grantees provided a total number of 151 categories of clinical services, across 1,155 sites in underserved rural communities for 1,306 sites and services. In all, 310 communities had access to pediatric services and 304 communities had access to adult mental health services for which they otherwise would not have had access.

### *Supporting Providers Ineligible for CMS EHR Incentive Payments*

Health care providers not eligible for the EHR Incentive Programs, such as long-term care, post-acute care, and behavioral health providers, have a frequent need to exchange health information on behalf of their patients, who are among the most vulnerable and whose care is most costly.<sup>16</sup> Advancing the adoption of certified EHR technology solutions to these providers will support the realization of the goals associated with implementing a nationwide health IT infrastructure and new models of care delivery and coordination.

In 2013, HHS released the *EHR Payment Incentives for Providers Ineligible for Payment Incentives and Other Funding Study*, which examined different aspects of health IT adoption, use, clinical utility, and benefits among ineligible providers. The report finds a limited capacity to examine health IT impacts on costs and care due to the lack of data available on the extent of ineligible providers' use of health IT. The report included factors for policymakers to consider for advancing the use of certified EHR technology solutions among ineligible provider groups.<sup>17</sup>

HHS also released guidance for EHR technology developers serving health care providers ineligible for EHR incentive payments. The guidance's purpose is to serve as a building block for EHR technology developers, federal agencies and stakeholders to use as they work with different communities to achieve interoperable HIE.<sup>18</sup>

### *Long-Term Services and Supports*

In March 2014, CMS awarded planning grants to nine qualified states to test quality measurement tools and demonstrate e-health in Medicaid community-based long term services and supports (LTSS). CMS designed the grant program, known as the Demonstration Grant for Testing Experience and Functional Assessment Tools or TEFT, to field test an experience survey and a set of functional assessment items, demonstrate personal health records, and create a standard electronic LTSS record. The state grantees will have an opportunity to extend the grant period to a total of four years. With the total grant program nearing \$42 million, this is the first time CMS is promoting the use of health IT in the community-based LTSS system. TEFT will provide national measures and valuable feedback on how health IT can be implemented in this component of the Medicaid system.

The nine states receiving initial planning grant awards are: Arizona, Colorado, Connecticut, Kentucky, Louisiana, Maryland, Minnesota, and Georgia. New Hampshire received funds to field test the experience survey.<sup>19</sup>

### *Behavioral Health*

HHS promotes widespread implementation of health IT systems supporting quality, integrated behavioral health care. ONC released an issue brief in 2013 exploring the adoption of health IT among behavioral health providers. The brief presented specific actions to improve information exchange among behavioral health providers through the following actions:

- ❖ Facilitating the adoption of national clinical data exchange standards for behavioral health, especially in the areas of substance abuse treatment and recovery.
- ❖ Facilitating the adoption of standardized privacy and confidentiality policies, including consent management, with patient data segmentation.
- ❖ Facilitating the creation of exemplar projects using national data standards to demonstrate the use of current behavioral health best practices and standard data collection.<sup>20</sup>

### ***Prescription Drug Monitoring Program***

Nonmedical use of prescription drugs is the nation's leading cause of accidental deaths, as almost 17,000 people die each year from overdoses involving prescription pain killers. Prescription Drug Monitoring Programs (PDMPs) are resources available to help clinicians identify, intervene, and curb prescription drug abuse. PDMPs are state-run electronic databases – functioning in 49 U.S. states and territories – that track the prescribing and dispensing of controlled prescription drugs to patients.

The Substance Abuse and Mental Health Services Administration awarded grants to nine states for the PDMP EHR Integration and Interoperability Expansion Cooperative Agreement Program, and grants to seven states for the EHR and Prescription Drug Monitoring Program Data Integration Cooperative Agreement program to reduce prescription drug misuse and abuse by providing health care providers with improved access to prescription drug data to make sound clinical decisions without disturbing their regular clinical workflow.

The Data Segmentation for Privacy (DS4P) initiative exemplifies HHS's work to facilitate standards to improve the interoperability of health records containing sensitive information that must be protected to a greater degree than other health information due to state or federal laws.

Additionally, in 2012 the Substance Abuse and Mental Health Services Administration (SAMHSA) provided a one-time supplemental funding to the Primary Behavioral Health Care Integration program to help 49 behavioral health grantees become meaningful users of EHR technology. Ninety-three percent of these grantees successfully implemented a certified EHR system, and this technology continues to support the integration of primary and behavioral health care in these programs.

## ***Consumer eHealth***

### *Increasing Patient Access to Health Information*

Research shows that providing patients or their caregivers with access to clinical information empowers them to better manage their health.<sup>21, 22, 23</sup> In 2012, only three in ten (30 percent) clinical laboratories allowed patients or their legal representatives direct access to their test results, and less than one in five clinical laboratories electronically shared results with their patients.<sup>24</sup> In February 2014, HHS amended the Clinical Laboratory Improvement Amendments of 1998 (CLIA) and the Health Insurance Portability and Accountability Act of 1996 (HIPAA) Privacy Rule to increase patients' rights to have direct access to their laboratory test results.<sup>25</sup> Together, with limited exceptions, the revised regulations require laboratories to give a patient, or his or her personal representative, access to the patient's completed test reports upon request.

### *Blue Button Pledge*

The Blue Button Pledge is a voluntary mechanism by which entities commit to advance efforts that increase patient access to and use of their own health data. Two types of organizations pledge: data holders and non-data holders. Data holders (i.e., payers, pharmacies, providers, hospitals) pledge to make it easier for consumers to move their personal health information out of proprietary silos and into their hands, allowing them to be truly engaged partners in their health and health care. Non-data holders (i.e., employers, consumer advocacy organizations) commit to help spread the word to consumers about the value of accessing their health information and using that information to better manage their health and care.

- ❖ To date, over 500 organizations have taken the Blue Button Pledge, including several federal supporters such as CMS, U.S. Department of Defense (DoD), U.S. Department of Veterans Affairs (VA) and Indian Health Service (IHS). HHS estimates that the organizations collectively reach approximately half of individual consumers and patients, providing access to at least some of their own health information electronically from a variety of sources.<sup>26</sup>

Additionally, ONC developed the Blue Button Toolkit, a website to help organizations figure out how to support consumers in obtaining access to their digital health data. The toolkit provides recommended

technical standards for enabling patients to view, download, and transmit their health information, a key requirement in Stage 2 of the EHR Incentives Programs. The website also provides marketing materials to help organizations communicate to consumers the value of having online access to their health information.

#### *Veterans-specific access to interoperable health records data*

The Veteran's Affairs (VA) Blue Button is available to veterans who use *My HealtheVet* to enable them to create a single electronic file that can include all of their available personal health information. Veterans who are VA patients and have a Premium *My HealtheVet* account can use the VA Blue Button to manage their health care as patients in VA medical facilities. The VA maintains a collection of resources for developers seeking to find ways to integrate VA Blue Button data with applications for use by *My HealtheVet* users. A few applications are already available that allow veterans to view their health care records on a smartphone or in a personal health record system. There are also developers working to enable other non-VA EHRs to receive health summaries from veteran records safely and securely.

#### ***Using Health IT to Improve Patient Safety and Care Quality***

ONC commissioned a recent systematic review of academic literature to understand the effects of health IT on key aspects of care, including health care quality, safety, and efficiency. The review found that the majority of studies published between 2010 and 2013 had positive associations between health IT and quality, safety, and efficiency.<sup>27</sup>

The following are some highlights of government efforts to understand and implement solutions to improve clinical quality and patient safety with health IT.

#### *Clinical Quality Improvement*

Clinical quality measures allow providers to quantify defined outcomes for clinical best practices and give providers the ability to monitor health outcomes in real time. ONC provides subject matter expertise and technical assistance to federal programs working to improve clinical quality. CMS, the Agency for Healthcare Research and Quality (AHRQ), the National Library of Medicine, and ONC worked to streamline clinical quality measure development processes and ensure availability of measures needed for the EHR Incentive Programs.

#### *Comprehensive Primary Care Initiative*

The Comprehensive Primary Care (CPC) initiative exemplifies CMS's work to streamline clinical quality measurement. The CPC is a four-year multi-payer initiative fostering collaboration between public and private health care payers to strengthen primary care. Approximately 480 primary care practices in seven U.S. regions, 44 commercial payers, and the Medicare Program participate in this initiative. In an effort to reduce providers' quality reporting burden, this initiative leverages the EHR Incentive Programs to

measure quality by using a subset of the clinical quality measures specified for reporting using certified EHR technology and aligning attestation of CQM measure results with EHR Incentive Programs attestation. CPC practices that successfully meet CPC reporting requirements are also able to obtain credit for reporting to the Physician Quality Reporting System (PQRS) if they elect the PQRS waiver offered through CPC. Participating CPC practices are required to use certified EHR technology, and all data results reported must be generated from certified EHR technology at the level of the CPC practice site.

### *Patient Safety*

In 2013, HHS released the *Health IT Patient Safety Action and Surveillance Plan*, following significant input from the public and other federal agencies.<sup>28</sup> The Safety Plan builds on recommendations in the 2011 Institute of Medicine (IOM) Report *Health IT and Patient Safety: Building Safer Systems for Better Care*.<sup>29</sup> The Health IT Safety Plan has two fundamental objectives: promote the health care industry's use of health IT to make care safe and continuously improve the safety of health IT.

The Plan outlines the responsibilities to be shared across HHS and details significant participation from the private sector. Through the Plan's implementation:

- ❖ ONC will make it easier for clinicians to report health IT-related incidents and hazards through the use of certified EHR technology.
- ❖ The Agency for Healthcare Research and Quality (AHRQ) will encourage reporting to Patient Safety Organizations and will update its standardized reporting forms to enable ambulatory reporting of health IT events.
- ❖ CMS will encourage the use of the standardized reporting forms in hospital incident reporting systems, and train surveyors to identify safe and unsafe practices associated with health IT.
- ❖ Working through a public-private process, ONC will develop priorities for improving the safety of health IT. ONC and CMS will consider adopting safety-related objectives, measures, and capabilities for certified EHR technology through the EHR Incentive Programs and ONC's Standards and Certification Criteria.

#### ***SAFER Guides***

In January 2014, ONC released the Safety Assurance Factors for EHR Resilience (SAFER) Guides. These interactive tools help health care providers more safely use electronic health IT products. Rigorously developed by leading health IT safety and informatics researchers and using the latest available evidence, expert opinion, stakeholder engagement, and field work, each SAFER Guide addresses a critical area associated with the safe use of EHRs through a series of self-assessment checklists, practice worksheets, and recommended practices.

### *User-Centered Design of EHRs*

HHS works to understand clinical workflows and the optimal design of EHR processes to improve efficiency and safety through enhanced usability. HHS works with experts in the field to guide the health IT industry to more consistently incorporate key user-centered design principles into EHR systems.

Examples include:

- ❖ **ONC's 2014 Edition Standards and Certification Criteria Final Rule** adopted two requirements related to usability and safety - one focuses on the application of user-centered design to medication-related certification criteria and another focuses on the quality management system used during the EHR technology design.<sup>30</sup>
- ❖ **ONC has funded work at University of Texas Houston** under the HITECH SHARP grant to develop tools for usability evaluation,<sup>31</sup> guidance for health IT developers as they begin to incorporate user centered design principles into their development lifecycle, and examples for how health IT developers might make complex tasks like medication reconciliation easier and more accurate.<sup>32</sup> This grantee also conducted research contributing to NIST EHR usability guidelines (Safety Enhanced Design) included in Stage 2 certification of the Health IT Certification Program.

### *Promoting Product Innovation*

In April 2014, the FDA, in consultation with ONC and the Federal Communications Commission (FCC), released a draft report<sup>33</sup> that includes a proposed strategy and recommendations for a health IT framework, which promotes product innovation while maintaining appropriate patient protections and avoiding regulatory duplication. The congressionally-mandated report<sup>34</sup> was developed in consultation with health IT experts and consumer representatives and proposes to clarify oversight of health IT products based on a product's function and the potential risk to patients who use it. The proposed regulatory strategy focuses on three health IT categories based on function and level of risk, focusing on the product's function, not operating platform (i.e., mobile medical device, PC, cloud-based).

- ❖ **First category:** Products with administrative health IT functions; poses little or no risk to patient safety and as such requires no additional oversight. They include software for billing and claims processing, scheduling, and practice and inventory management.
- ❖ **Second category:** Products with health management health IT functions; includes software for health information and data management, medication management, provider order entry, knowledge management, electronic access to clinical results and most clinical decision support software.
- ❖ **Third category:** Products with medical device health IT functions are a narrowly defined group that could potentially pose greater risks to patients if they do not perform as intended. The draft report proposes that FDA continue regulating these products, which include computer-aided detection software, software for bedside monitor alarms, and radiation treatment software.

### *HITECH Beacon Community Program*

The Beacon Community Cooperative Agreement Program demonstrates ways that health IT investments and meaningful use of EHRs can advance the vision of patient-centered care. Upon the program's completion in 2014, ONC and the 17 Beacon Communities compiled and synthesized lessons learned to develop six Learning Guides that provide proven strategies and actionable information other communities can adopt. The lessons learned from building health IT infrastructure, driving population health improvement, and testing innovative approaches provide targeted advice to community health partners including hospitals, health systems, individual practices, and community organizations to advance community-level health care transformation using health IT.<sup>35</sup>

### *AHRQ Health IT Research Agenda: Best Practices Transforming Quality, Safety, and Efficiency*

The Agency for Healthcare Research and Quality's (AHRQ) health IT portfolio develops, synthesizes, and disseminates the best evidence on how health IT can improve health care quality. The portfolio supports the nation's drive to adopt and meaningfully use health IT by building and synthesizing the evidence base. AHRQ's National Resource Center for Health IT provides broad and ready access to the research and experts funded by the portfolio. Early efforts evaluated the facilitators and barriers to health IT adoption in rural America<sup>36</sup> and the value of health IT implementation.<sup>37</sup> Recent results from one AHRQ-funded grant showed that telemedicine improved the cure rate for hepatitis C and reduced health care disparities.<sup>38</sup> Recently, AHRQ finalized a multiyear research initiative focused on quality improvement in primary care that addressed medication management, patient-centered care, and clinical decision support.

## PROGRESS ON THE EXCHANGE AND INTEROPERABILITY OF HEALTH INFORMATION

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Timely and effective communication and information sharing is essential to improve care quality, better community health, and lower per capita costs. Electronic health information exchange (HIE) allows health care professionals and patients to access and securely share vital health information. Examples of HIE include: clinical laboratories electronically sending test results to a health care provider's EHR and hospitals electronically sharing discharge summaries with primary care providers. Health care providers use various mechanisms to electronically share clinical information with other providers and patients, including using their EHR to send a secure message to another provider's EHR or through third-party health information organizations (HIOs), entities that oversee and govern the exchange of health-related information among health care organizations according to nationally recognized standards.

For HIE to be effective in a clinical setting, the information shared must be interoperable. Interoperability is generally accepted to mean the ability of two or more IT systems or components to exchange information and use exchanged information.<sup>39</sup> For example, if a laboratory test result is sent from a laboratory to a provider's EHR, but does not use technology standards recognized by the health care provider's EHR system, then the information cannot be electronically integrated into the patient's health record.

HHS focuses on establishing policies and standards to facilitate three key forms of exchange, including:

- ❖ *Directed exchange*: The secure sharing of electronic health information between two known and trusted parties is a common approach to support coordinated care.
- ❖ *Query-based exchange*: The ability to electronically find or request patient information frequently from other providers, often used for unplanned care.
- ❖ *Consumer-mediated exchange*: The ability of patients to aggregate and control the use of their health information among providers.<sup>40</sup>

The following sections highlight (1) baseline levels of HIE prior to the HITECH Act, (2) current levels of exchange among hospitals, physicians, clinical laboratories, and pharmacies, and (3) key barriers to HIE. The sections also cover progress made by the federal government and other entities in advancing HIE, including efforts to make shared information secure and private, as well as efforts to promote the common use of standards to enable care providers and patients to effectively use information received from other health care providers.

## EVIDENCE OF PROGRESS

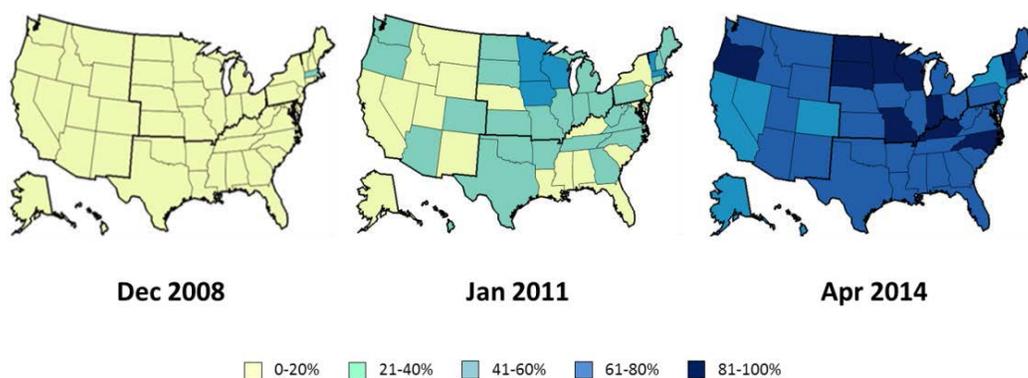
In 2008, four in ten (41 percent) hospitals shared data electronically with physicians or hospitals outside of their organization.<sup>41</sup> That same year, less than one in ten providers (7 percent) sent prescriptions electronically on one of the nation's largest e-prescribing networks (Surescripts); only four percent of new and renewal prescriptions were sent electronically, while three-quarters of pharmacies (76 percent) were active on the Surescripts Network. The following section shows progress related to HIE among these provider types and organizations.

### *HIE Among Physicians*

In 2013, more than two-thirds of physicians (69 percent) reported the capability to order lab tests electronically. More than three-quarters (77 percent) reported they can view lab results electronically. In addition, four in ten (42 percent) provide patients the capability to view online, download, or transmit information from their medical record, a requirement for Stage 2 of the EHR Incentives Programs.<sup>42</sup>

There have been significant increases in e-prescribing among health care providers. Recent analysis of national e-prescribing transaction data indicates that 57 percent of new and renewal prescriptions sent by physicians in 2013 were sent electronically. This represents a fourteen-fold increase since 2008. Moreover, in 2013, 70 percent of providers use an EHR to e-prescribe on the Surescripts Network, a 63 percentage point increase since 2008 (Figure 3). The proportion of the nation's community pharmacies actively e-prescribing on the Surescripts Network grew from 76 percent in 2008 to 96 percent in 2013, an increase of 20 percentage points.<sup>43</sup>

**Figure 3. Percent of physicians e-prescribing using an EHR through April 2014, by state.**

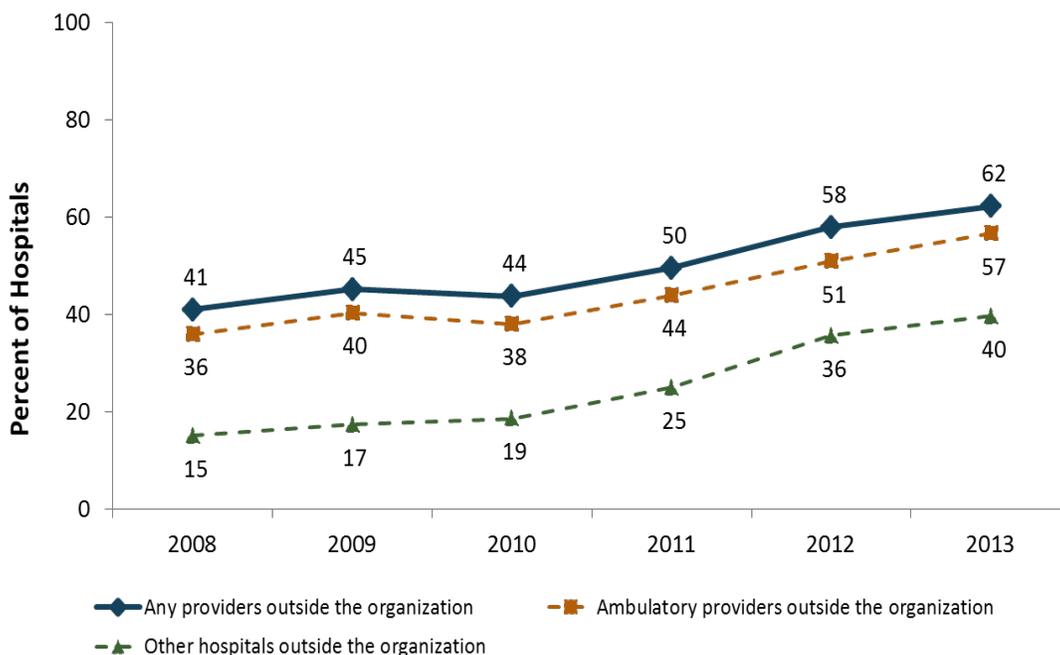


SOURCE: ONC analysis of physician prescriber data from Surescripts. Denominator from SK&A 2011 full-year file.

## HIE Among Hospitals

More than half of hospitals electronically shared radiology reports (55 percent) and laboratory results (57 percent) with any providers outside of their system. In addition, more than one-third of hospitals electronically shared clinical care summaries (42 percent) and medication lists (37 percent) with any providers outside of their system, a 68 percent increase in the exchange of clinical care summaries and 76 percent increase in the exchange of medication lists since 2008.<sup>44</sup>

**Figure 4: Percent of non-federal acute care hospitals that electronically exchanged laboratory results, radiology reports, clinical care summaries, or medication lists with outside providers and hospitals: 2008-2013.**



SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement

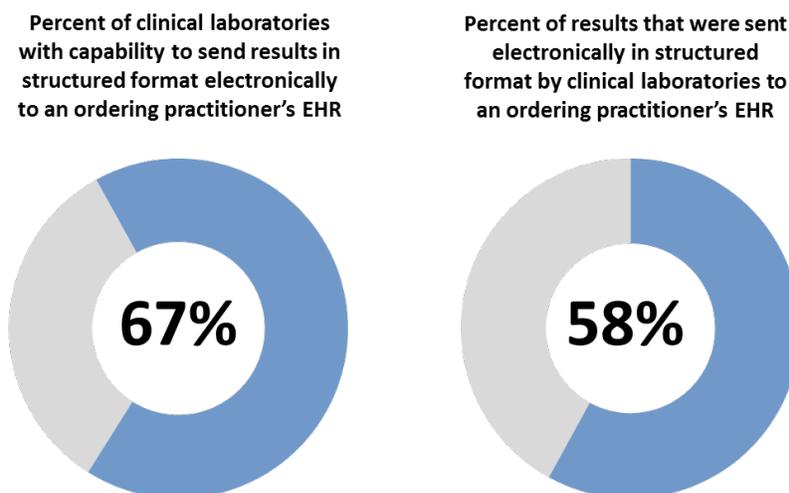
- ❖ More than six in ten hospitals electronically exchanged patients' health information with any providers outside their organization, a 51 percent increase since 2008.
- ❖ 57 percent share patient health information with ambulatory providers outside their organization.

Hospitals shared information using a variety of mechanisms. Four in ten (41 percent) send and receive secure electronic messages containing patient's health information outside their system.<sup>45</sup> Half of hospitals (51 percent) reported the capability for their providers to electronically query patient health information from sources outside their system.<sup>46</sup>

## *HIE Among Clinical Laboratories*

Incorporating clinical laboratory test results into certified EHR technology as structured data is a core requirement for eligible hospitals and professionals under Stage 2 of the EHR Incentive Programs.

**Figure 5: Health information exchange among clinical laboratories.**



SOURCE: ONC analysis of data from National Survey on Health Information Exchange in Clinical Laboratories, 2012. [47](#)

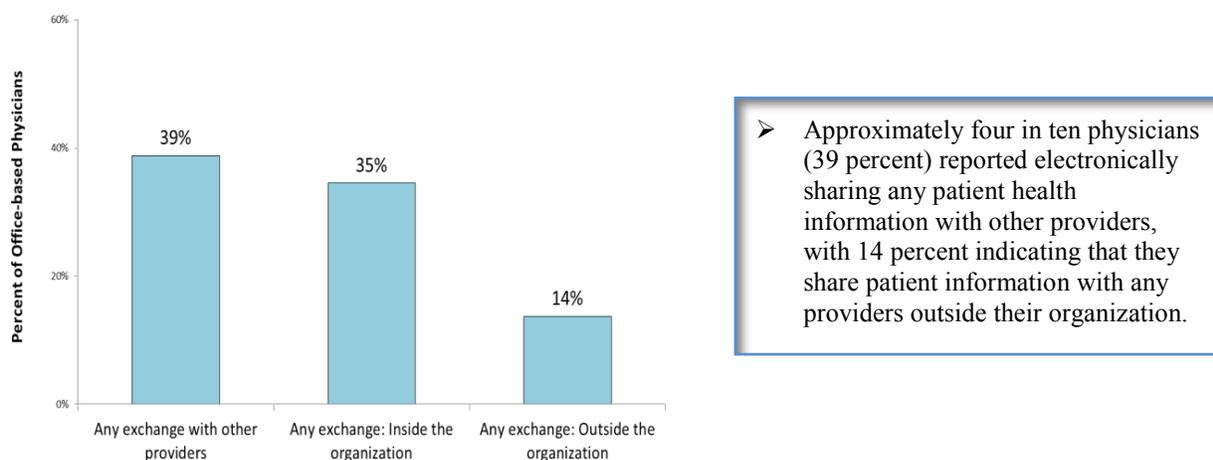
- ❖ Two-thirds of clinical laboratories reported the capability to send structured test results to an ordering practitioner's EHR.
- ❖ Over half (58 percent) of test results that were processed in 2012 by hospital and independent laboratories were sent electronically to ordering practitioners.

## EVIDENCE OF BARRIERS TO HIE

Despite recent progress, gaps and challenges remain for the widespread use of interoperable systems and HIE across providers, settings of care, consumers and patients, and payers. There is even more limited HIE involving post-acute and institutional long-term care, most behavioral health, and laboratory providers who are not eligible for incentive payments under the EHR Incentive Programs.<sup>48</sup> Close to 40 percent of Medicare beneficiaries discharged from acute care hospitals are discharged to post-acute care settings, like rehabilitation hospitals and skilled nursing facilities, but there is little capacity in the system today to support HIE across these settings.<sup>49</sup> Additionally, the infrastructure for an HIE is primarily high-speed internet service, which is not readily available in all rural areas.

Deficits in communication remain despite increases in data exchange among hospitals, which often is limited due to reasons besides technological capability, such as organizational culture and provider workflow. Nearly half of hospitals (48 percent) provide electronic notification to a patient's primary care provider when the patient enters the emergency department; but just less than one-quarter (24 percent) provide it outside their system.<sup>50</sup> In 2013, only 14 percent of physicians shared patient information with any providers outside their organization.<sup>51</sup>

**Figure 6. Percent of office-based physicians that electronically share patient health information with other providers: 2013.**



SOURCE: CDC/NCHS, National Electronic Health Records Survey, 2013.

In April 2014, HHS released a report by JASON, an independent group of scientists advising the federal government on matters of science and technology, called *A Robust Health Data Infrastructure*.<sup>52</sup> The JASON report presents technical, broad policy, and privacy and security issues that are both opportunities and challenges to advance an agenda of meaningful exchange and interoperability. This report highlighted two fundamental and mutually dependent challenges the U.S. health care system must meet to further advance a robust health data infrastructure:

- ❖ The current lack of interoperability among data resources for EHRs is a major impediment to the unencumbered exchange of health information and the development of a robust health data infrastructure. Interoperability issues can be resolved only by establishing comprehensive, transparent, and overarching software architecture for health information.
- ❖ The twin goals of improved health care and lowered health care costs will be realized only if health related data can be explored and exploited in the public interest, for both clinical practice and biomedical research. That will require implementing technical solutions that both protect patient privacy and enable data integration across patients.

## SPECIFIC ACTIONS TAKEN BY THE FEDERAL GOVERNMENT

HHS is working to transform the U.S. health care delivery system into one that is patient-centered and value-based. Existing Medicare and Medicaid programs and initiatives and new programs authorized by the Affordable Care Act expand upon the infrastructure advanced through the HITECH Act activities to focus on new service delivery and payment models that encourage and facilitate greater coordination of care and improved quality. These new initiatives include accountable care organizations (ACO), bundled payments, health, medical, and community homes, and reductions in payments for hospital readmissions. Real-time interoperable health information exchange amongst a variety of health care stakeholders (e.g., clinicians, laboratories, hospital, pharmacy, health plans, payers and patients), regardless of the technology or developer, is critical to the success of these programs and the ultimate goal of an improved health care system.<sup>53</sup> Greater access to person-level health information is integral to improving the quality, efficiency, and safety of health care delivery.<sup>54, 55</sup>

In June 2014, ONC released *Putting Health Information in the Hands of the Nation: A Ten Year Vision for Widespread Health IT Interoperability 2014 to 2024*.<sup>56</sup> This paper describes ONC's vision and framework for interoperability and is an invitation to health IT stakeholders – clinicians, consumers, hospitals, public health, technology developers, payers, researchers, policymakers and many others – to join ONC in developing a defined, shared roadmap to collectively achieve health IT interoperability as a core foundational element of better care, at a lower cost and better health for all. It contains guiding principles for working towards this vision and sets the following high-level agenda:

- ❖ *Three-Year Agenda*: Send, receive, find and use health information to improve health care quality
- ❖ *Six-Year Agenda*: Use information to further improve health care quality and lower cost
- ❖ *Ten-Year Agenda*: The learning health system for population health.

### ***Actions Supporting Core HIE Building Blocks***

The vision paper also sets the groundwork for developing a shared agenda among the federal government, state and local governments, and the private sector. The agenda focuses on five critical interconnected and incremental building blocks for a nationwide interoperable health information infrastructure:

1. Core Technical Standards and Functions
2. Certification to Support Adoption and Optimization of EHRs and HIE services
3. Privacy and Security Protections for Health Information
4. Supportive Business, Clinical, and Regulatory Environments
5. Rules of Engagement and Governance

## ***Building Block 1: Core Technical Standards and Functions***

HHS leads many efforts designed to accelerate nationwide progress towards an interoperable health IT infrastructure by convening federal agencies and other partners to advance HIE solutions. Efforts include working with standard development organizations to promote and maintain existing technical standards and developing new standards critical for the standards and certification criteria that are to be adopted by HHS in rulemaking. Ensuring consistent adoption of standards and policies for health IT applications used across all settings of care aimed to support interoperability and health information exchange. HHS supports initiatives to standardize meaning (e.g., common vocabulary to code clinical tests), structure (e.g., how information is captured and organized), transport (e.g., mechanism in which information is sent between health care providers), security (e.g., standards to protect patient's confidential information), and services (e.g., methods to accurately match individuals, providers and their information across data sources).

### *State HIE Program*

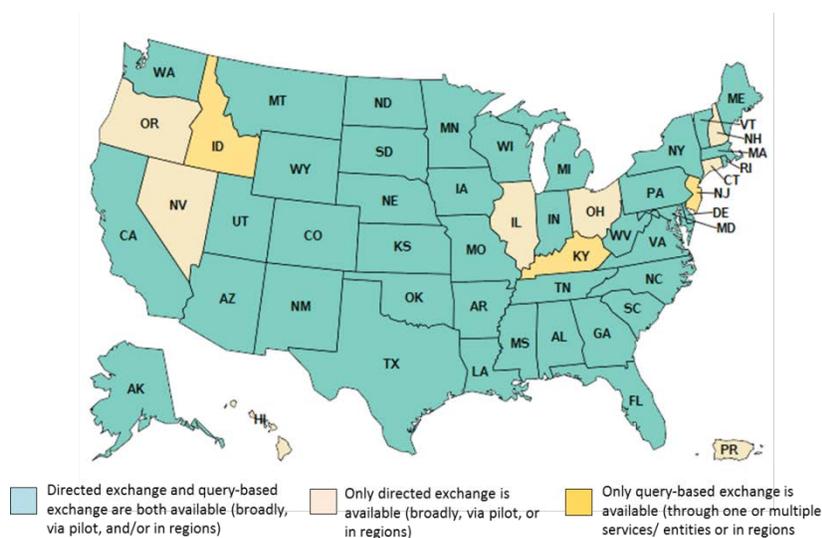
In March 2010, ONC launched the State HIE Cooperative Agreement Program. In total, 56 states, eligible territories, and qualified state-designated entities (SDE) received awards to rapidly build capacity for exchanging health information across the health care system, both within and across states. Grantees were responsible for increasing connectivity and enabling patient-centric information flow to improve the quality and efficiency of care. The continual evolution and advancement of necessary governance, policies, technical services, business operations, and financing mechanisms for HIE over each state, territory, and SDE's four-year performance period was key to this goal. This program leveraged existing efforts to advance regional and state-level health information exchange.

### ***Glide Path***

ONC released a white paper, *Glide Path from HITSP C83 to C-CDA*, geared towards health IT executives, program leaders, system architects, and health care professionals involved in HIE efforts.

The Glide Path provides an intuitive summary of the history and current state of standards and specifications for clinical document exchange in healthcare. This paper addresses the implications that new Stage 2 EHR Incentive Programs' standards will have on prior work efforts, and offers guidance to health IT decision makers and implementers on a pathway to use new standards promoted by CMS and ONC.

**Figure 7. Directed and Query-Based Exchange Combined Exchange Implementation Status, 2013.**



SOURCE: State HIE Program Measures Dashboard: <http://healthit.gov/policy-researchers-implementers/state-hie-implementation-status>  
 NOTES: Statistics are based on self-reports from grantees participating in the State HIE Cooperative Agreement Program

- ❖ As of Q4 2013, 47 states and territories have directed exchange broadly available;<sup>ii</sup> this is a 52 percent increase since the second quarter of 2012.
- ❖ During this same period, 34 states and territories have operational query-based exchange available statewide, a 79 percent increase since the second quarter of 2012.

The program also monitored the adoption status of each grantee in terms of the number of clinical and administrative staff and organizations enabled for directed and query-based exchange through the program’s grantee-funded or supported mechanisms, such as health information organizations.

- ❖ 130,662 clinical and administrative staff and 43,191 organizations were enabled for directed exchange.
- ❖ 180,426 clinical and administrative staff and 12,048 organizations were enabled for query-based exchange.

<sup>ii</sup> Broadly available: Regional- and state-level entities that facilitate exchange across unaffiliated organizations exist and can be subscribed to for directed exchange and/or query-based exchange. These broadly available options and services do not account for exchange enabled by enterprise (private) HIE entities serving integrated delivery networks (IDNs) or hospital systems.

### *Behavioral Health Data Exchange*

The Behavioral Health Data Exchange Consortium facilitated and addressed barriers to the intra- and interstate exchange of behavioral health data. ONC and state partners designed the project to be flexible, recognizing the initial research results regarding policies, procedures, and laws would determine the direction and scope of the pilot test activities. In addition, participants put these policies and procedures into practice by connecting their state-level systems to allow for directed exchange. Data segmentation standards work is also occurring to advance exchange of behavioral health data.

### ***Building Block 2: Certification to Support Adoption and Optimization of Health IT Products and Services***

Under Stage 2 of the EHR Incentive Programs, the Health IT Certification Program promotes increased exchange among providers and hospitals eligible for incentive payments. The 2014 edition of health IT certification contains transition of care criteria, focused on secure messaging functionality and standardized clinical care summaries. The EHR Incentive Programs specified the minimum data elements that must be included when summaries are exchanged. Eligible professionals and hospitals are required to provide a summary of care record for more than 50 percent of transitions and referrals and use either certified EHR technology or the eHealth exchange for more than ten percent of transitions and referrals. Additionally, eligible professionals and hospitals must conduct one or more successful electronic exchange of a summary of care document with a recipient using a different EHR developer or conduct one or more successful tests with the CMS – designated test EHR.

Through the Standards and Interoperability (S&I) Framework and the Standards Implementation and Testing Environment (SITE) Platform, ONC coordinates and convenes stakeholders to develop and harmonize standards, and provides testing and data infrastructure to validate the efficiency of proposed standards for inclusion in the Health IT Certification Program. ONC also acts as the managing partner of the Federal Health Architecture (FHA), a partnership of more than 20 federal agencies joining together to implement government-wide solutions to health IT that address agency business priorities while protecting citizen privacy. In addition, the S&I Framework empowers health care stakeholders to establish standards, specifications and other implementation guidance that facilitate effective exchange of health care information.

### ***Building Block 3: Privacy and Security Protections for Health Information***

Privacy and security are foundational to ensure trust in health IT and participation in HIE. HHS contributes health sector-specific subject matter expertise and technical assistance on privacy, security, and data stewardship policies. Specifically, HHS:

- ❖ Identifies evolving health IT and health information exchange efforts, assesses gaps and vulnerabilities in their privacy and security protections, and proposes policy solutions.
- ❖ Coordinates with state and regional efforts, federal agencies, and foreign countries on health information privacy and security issues.

- ❖ Develops and disseminates guidance, toolkits, and multimedia technical assistance materials to increase awareness among stakeholders that the privacy and security of health information is a shared responsibility.

HHS's focus is to ensure that privacy and security are adequately addressed in implementing the EHR Incentive Programs, within delivery and payment reform, and as health IT adoption and HIE advance. HHS released a variety of technical assistance resources to help providers and other stakeholders ensure privacy and security of health information are adequately addressed as health IT is adopted. HHS is committed to develop these materials in clear, concise, well-organized formats and ensure they are varied to meet different users' learning styles. Through these efforts, HHS aims to assure consumers and providers that health IT can protect sensitive information and be used securely when providing care.

### *Security Risk Assessment Tool*

In March 2014, HHS released a security risk assessment tool to help guide health care providers in small to medium sized offices in conducting organizational risk assessments. The tool's website contains a User Guide and Tutorial video to help providers begin using the tool. Videos on risk analysis and contingency planning are available at the HHS Office for Civil Rights (OCR) and ONC websites to provide further context.

### *Privacy and Security Rules*

The HHS Office for Civil Rights (OCR) helps to protect the privacy and security of health information by administering and enforcing the HIPAA Privacy Rule, which protects the privacy of individually identifiable health information; the HIPAA Security Rule, which sets national standards for the security of electronic protected health information; and the HIPAA Breach Notification Rule, which requires covered entities and business associates to provide notification following a breach of unsecured protected health information. A "covered entity" is a health plan, health care clearinghouse, and a health care provider who transmits health information in electronic form in connection with transactions for which the Secretary of HHS has adopted standards under HIPAA. A "business associate" is any person or organization that performs certain functions or activities on behalf of a covered entity that involves the use or disclosure of health information. OCR works to ensure that the practices of an estimated four million health care providers, health plans, health care clearinghouses, and their business associates adhere to the requirements in the HIPAA Privacy, Security, and Breach Notification Rules by investigating citizen complaints and self-reports of breaches, and conducting compliance reviews and audits.

In January 2013, HHS issued the HIPAA Omnibus Final Rule (Final Rule) that implemented a number of provisions of the HITECH Act that strengthened the privacy and security protections for health information established under HIPAA. The Final Rule provides individuals with new rights to their

health information and increases the privacy and security protections for health information. Before the Final Rule was issued, the requirements of the HIPAA Privacy and Security Rules applied to covered entities only; however, some of the largest breaches reported to HHS have involved business associates. As a result of the Final Rule, certain requirements in the HIPAA Privacy Rule and all the requirements in the HIPAA Security Rule now apply directly to business associates. The Final Rule expands and creates new individual rights in important ways. For example, patients have greater rights to receive a copy of their medical record in an electronic format and restrict providers from sharing information related to services paid out-of-pocket, in full, with insurers for payment or operations purposes. The Final Rule also modified the HITECH Breach Notification requirements by clarifying when entities must report breaches of unsecured health information to HHS.

In October 2009, HHS issued the HITECH Enforcement Interim Final Rule that increased the civil money penalties for HIPAA violations significantly. Penalties are increased for noncompliance and are based on four categories of violations that reflect increasing levels of culpability. The maximum penalty amount for identical violations within a calendar year is \$1.5 million.

OCR consistently enforces the HIPAA Privacy, Security, and Breach Notification Rules. Since the beginning of the HIPAA compliance and enforcement program, OCR has investigated and resolved over 33,000 HIPAA complaints. Additionally, OCR has imposed one civil monetary penalty and negotiated 22 settlements of potential HIPAA violations. Twenty-one of these settlement agreements included detailed corrective action plans. These settlements corrected the non-compliance on the part of the covered entities and most resulted in settlement payments that OCR put toward furthering health information privacy and security enforcement efforts.

#### *Patient Control over Use and Disclosure of Personal Health Information (PHI)*

As providers adopt and use health IT, HHS has conducted several activities to empower patient control over how their health information is used and disclosed. HHS continues to coordinate pilots as part of the Data Segmentation for Privacy (DS4P) initiative to test tagging data to mark as sensitive and requires special protection and to notify the recipient of any data restrictions. In five pilot sites, providers were able

#### ***Increasing Public Awareness***

In 2013, the Office for Civil Rights designed and implemented a public education campaign to increase the American public's awareness of and confidence in the privacy and security of their health information, particularly with EHRs. Highlights of these consumer-focused efforts include the development of eight videos on OCR's YouTube channel, which have generated over 1.8 million views since posting. Of note is the creation of a Spanish-language video on consumers' health information privacy rights which has over 500,000 views.

to exchange sensitive substance and alcohol abuse treatment information and alert the receiving system not to further disclose the information without patient consent.

Additionally, ONC launched an online resource to help health care providers effectively engage patients in choosing whether and how they want their health information shared through an HIO. Having a meaningful choice in how your information is shared is known as “meaningful consent.” The online resource provides reference information on policies and issues related to HIE, and includes background, lessons learned, strategies and customizable tools for health care providers to use to engage and educate patients. ONC designed this information for use by providers, certain HIOs and other implementers of health IT.<sup>57</sup>

In September 2013, HHS also released model Notices of Privacy Practices for use by health care providers and health plans to inform patients of their health privacy rights, including the right to access their health information. The notices use plain language and reflect the most recent changes to HIPAA. The notices have over 177,000 downloads.

#### ***Building Block 4: Supportive Business, Clinical, Cultural, and Regulatory Environment***

Some current policies and financial incentives prevent interoperable HIE, even when it is technically feasible. In collaboration with employers and private payers, HHS will help define the role of health IT in new payment models that can remove the current disincentives to information exchange. Incremental steps to accelerate health information exchange will initially stem from Affordable Care Act (ACA) delivery system reform programs and Medicare payment regulations. HHS will consider ways in which the adoption and use of certified health IT products can be aligned with and encouraged by Medicare and Medicaid payment policy and other HHS programs funding health care delivery so that care delivery transformation and interoperability evolve in tandem.<sup>58</sup> The following are efforts currently in place to reduce regulatory burdens and business barriers that prevent data flow.

##### *Federal Medical Assistance Percentages*

Under the CMS Medicaid EHR Incentive Program, states are eligible for 90 percent federal matching funds for HIE activities. CMS has instructed states on the use of the enhanced 90/10 Medicaid Federal Medical Assistance Percentages (FMAP) to support HIE activities, as authorized by HITECH. This includes HIE efforts tied to EHR adoption, linking laboratory or other data sources for Medicaid eligible professionals through HIE, and supporting hardware and software EHR/HIE linkages at the provider site that will support Medicaid providers’ meaningful use of certified EHR technology.<sup>59</sup>

##### *Linking HIE to Delivery System Transformation*

HHS pursues health care transformation efforts both independently and through state collaboration, employing interoperable health IT in different ways. These efforts have led to improvements in interoperability with shared activity among otherwise competing interests. Federal investments support

the majority of states in some manner, whether through Medicaid or Medicare programs. HHS uses various policy-levers to link HIE with delivery transformation. Below are two examples where HHS uses HIE to promote care coordination in federal delivery transformation initiatives:

State Innovation Models Initiative: The State Innovation Models Initiative (SIM) provided \$300 million in Round 1 -- and makes up to \$730 million available in Round 2 -- to support states' development and testing of innovative state-based models for multi-payer payment and health care delivery system transformation. The CMS SIM aims to improve health system performance statewide, resulting in improved health, improved quality, and lower cost of care for participating states' residents. The projects are broad-based and focus on Medicare, Medicaid and the Children's Health Insurance Program (CHIP) enrollees. The CMS awards SIM grants via its Innovation Center; some participating states have elected to incorporate incentives and funding for HIE and EHR adoption among long-term care providers, behavioral health providers, federally qualified health centers (FQHCs) and other safety net providers to encourage participation in the states' multi-payer service delivery and payment models.

CMS Health Care Innovation Awards: The CMS Health Care Innovation Awards will award up to \$1 billion to test new models of value-based payment and service delivery. The second round of Health Care Innovation Awards fund applicants that have a high likelihood of driving health care system transformation and delivering better outcomes, including models that advance HIE to support care coordination, quality improvement, and lower costs.

### ***Building Block 5: Rules of Engagement and Governance of Health Information Exchange***

Governance of HIE is the structures, agreements, and business practices necessary to ensure health information is kept private and secure, while allowing for efficient HIE between care settings and across organizational, EHR developer, and geographic boundaries.

In 2013, ONC released the Governance Framework for Trusted Electronic Health Information Exchange. This Framework provides a common foundation for all types of HIE governance models. Other entities setting HIE policy can refer to the Framework's principles as a way to align their work with national priorities. ONC will continually monitor the ease of the electronic HIE between care settings and across organizational, EHR developer, and geographic boundaries to consider whether enhancements to the nationwide governance approach are needed.<sup>60</sup>

#### ***HIE Governance Entities***

ONC funded two HIE governance entities under the Exemplar Health Information Exchange Governance Entities Program to develop and adopt policies, interoperability requirements and business practices that align with national priorities; reduce implementation costs; and assure the privacy and security of health information.

Moving forward, ONC will build on the Framework and principles to ensure individual access, privacy, transparency, responsible financial and business practices, and use of federal standards to support HIE.

As needed, ONC will identify the “rules of the road” necessary for information to flow efficiently across networks and will transition to a governance approach for HIE that will likely involve both policy and collaboration across industry, government, and consumer representatives.

### ***HIE to Support Public Health***

Public health agencies collect health information to detect, track, and manage disease outbreaks. Local and state public health departments rely on information from health care providers. Traditionally, health care providers reported this information by paper, phone, and fax. Health IT tools can provide a faster and more accurate way of moving critical information from providers to health departments. These tools can also help public health departments conduct medical product safety surveillance, analyze population health trends, and educate and promote healthy choices for populations. The EHR Incentive Programs’ public health reporting requirements are spurring development of public health infrastructure to receive structured data from EHRs, increasing partnerships between health information organizations and public health, and fostering the development of public health reporting standards.<sup>61</sup>

With increased EHR adoption, health care providers can more rapidly report public health data to public health agencies. This public health data can be formatted in standardized ways and sent using commonly accepted content standards, which reduces translation and need for system updates to accept the data. In 2014, ONC released an issue brief, *Health IT for Public Health Reporting and Information Systems*,<sup>62</sup> which covers efforts to standardize public health data collection and reporting, opportunities to improve these efforts, and concerns moving forward.

In addition to certain core requirements, Stage 1 of the EHR Incentive Programs provides both eligible professionals and hospitals the option to choose from a menu of objectives, including reporting immunization information and syndromic surveillance data to the appropriate public health agency; eligible hospitals also have the option to report electronic lab results.

### ***National Program of Cancer Registries***

This program funds central cancer registries to collect, manage, and analyze data about cancer cases for 96% of the U.S. population, effectively providing a census of all cancer cases in the nation. This data enables health agencies to report on cancer trends, assess the impact of cancer prevention and control efforts, and participate in research.

CMS included cancer reporting from providers to state cancer registries as a requirement in the final rule for Stage 2 EHR Incentive Programs. Enhanced use of EHRs will improve the timeliness, completeness and quality of cancer data reported from non-hospital facilities and increase public health programs' ability to plan and target health care interventions designed to reduce cancer incidence or improve early detection.

- ❖ In 2013, approximately 7 out of 10 (68 percent) primary care physicians eligible for the Medicare EHR Incentive Program selected the Immunization menu measure without exclusion.<sup>63</sup>
- ❖ Almost nine in ten (87 percent) of all eligible hospital attestations include at least one instance of the hospital selecting a public health measure.
- ❖ Immunization reporting is the most commonly selected measure with two-thirds (66 percent) of all eligible hospitals selecting the measure; and one in ten (11 percent) of the eligible hospitals selecting the immunization measure claim exclusion.<sup>64</sup>

Stage 2 of the EHR Incentive Programs requires eligible hospitals to submit syndromic surveillance, electronic lab results, and immunization data to public health agencies. Furthermore, Stage 2 requires eligible professionals to report immunization data and gives professionals the option to choose from a menu of additional objectives, including reporting to cancer registries, specialized registries (e.g., birth defects registries, chronic disease registries, traumatic injury registries), and syndromic surveillance.

#### *Surveillance Performance Trends*

All 50 states have a National Electronic Disease Surveillance System-compatible system to report notifiable diseases. A state's information system must meet an established set of requirements, enabling states to share information efficiently with the CDC and other health agencies. In 2013, half of public health agencies can receive production syndromic surveillance meaningful use-compliant messages from certified EHR technology.<sup>65</sup>

#### *Immunization Information Systems*

Anticipating the evolving role of public health, the CDC directed immunization resources to prepare for the new health care environment. The CDC made investments in immunization information systems that inform and support clinical decision-making and allow interfacing with EHRs and vaccine ordering systems—helping more than 95 percent of 56 awardees to reach full compliance with the consensus driven Health Level Seven (HL7) messaging standards for immunization data transactions.

- ❖ Nearly two-thirds (64 percent) of public health agencies (or their designee) can receive Immunization Information System meaningful use-compliant messages from certified EHR technology.<sup>66</sup>

#### *Laboratory Standards and Services Performance Trends*

In 2013, the CDC supported regional capacity building for emergency preparedness through awards to form a northeast regional network of eight state (and one metropolitan) public health laboratories to share testing services. The CDC also supported state public health labs with an informatics self-assessment tool to assist with gap analysis and decision-making, which resulted in enhanced safety and security of laboratories, accuracy and timeliness of test results, and responses to outbreaks. These achievements enabled the CDC to improve the cost efficiency of clinical testing procedures.

The CDC recently evaluated electronic laboratory reporting by the 10,400 labs that send reportable data to health agencies. They found that the number of state and local health departments receiving electronic laboratory reports (ELR) from laboratories has more than doubled since 2005.

- ❖ More than six in ten (62 percent) of total lab reports were received electronically.<sup>67</sup>
- ❖ As of April 2014, 56 of 57 (98%) of public health agencies can receive production ELR meaningful use-complaint messages from certified EHR technology use by eligible hospitals.

## HHS EFFORTS TO GATHER AND USE RECOMMENDATIONS

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ONC uses its convening authority to engage with a diverse group of private, non-profit, and public sector stakeholders to identify health IT policy issues and forge consensus-based solutions. By investigating alternative and creative solutions, ONC designs policies to remove barriers that limit market progress to achieve the meaningful use and optimization of health IT. These solutions must keep pace with the evolving health IT market by continuing to create new opportunities for investment and improve purchasers' confidence in their health IT choices.

The *Federal Health IT Strategic Plan 2011 – 2015* reflects a coordinated strategy between the public and private sector to improve the quality, efficiency, safety and patient-centeredness of health care through the use of health IT. Additionally, agencies within HHS use the annual Congressional Justification of Estimates for Appropriations Committees to make formal recommendations to Congress to advance health IT adoption and use across the health care delivery system.

Collectively, these documents contain recommendations to advance health IT adoption and secure interoperable exchange. To inform these recommendations, HHS agencies leverage town hall meetings, Requests for Comment, various social media resources, and other mechanisms to obtain information for policy objectives and strategies. Below is a summary of key activities that inform HHS policy objectives and strategies related to health IT adoption, the privacy and security of health information, and HIE and interoperability.

### *Federal Advisory Committees*

ONC maintains two Federal Advisory Committee Act (FACA) bodies, also known as advisory committees: the Health IT Policy Committee (Policy Committee) and the Health IT Standards Committee (Standards Committee).

The Policy Committee makes recommendations to the National Coordinator on a policy framework for the development and adoption of a nationwide health information infrastructure, including standards for the exchange of patient medical information. ONC solicits recommendations from the Policy Committee to inform policy decisions and guide the development of pilots, studies, and other programs used to inform future stages of policy development.

The Standards Committee is charged with making recommendations to the National Coordinator on standards, implementation specifications, and certification criteria for the electronic exchange and use of health information. ONC works with the Standards Committee to ensure standards, implementation specifications, and certification criteria support federal health IT policies and are responsive to the needs of the health IT community and marketplace.

Several workgroups have formed as sub-committees to the parent FACAs. These workgroups meet periodically to discuss their topics, present their findings at Health IT Policy and Standards Committees meetings, and make recommendations to the Health IT Policy and Standards Committees. A full list of recommendations from the Policy Committee<sup>68</sup> and Standards Committee<sup>69</sup> can be found on HealthIT.gov.

#### *Advancing Health IT Adoption*

HHS leverages the Request for Comment process to inform rules, policies, and strategies. Recently, recommendations from the advisory committees for policies, standards, and certification criteria related to Stage 3 of the EHR Incentive Programs are currently under review. Furthermore, a Request for Comment process informed the subsequent set of standards, implementation specifications, and criteria for the Health IT Certification Program. In May 2014, the Policy Committee held two virtual listening sessions to hear from the health care community on successes and challenges to achieve meaningful use and to inform recommendations for Stage 3 of the EHR Incentive Programs. Specifically, the Committee sought feedback in four areas to address national health priorities and key gaps in EHR functionality: clinical decision support, patient engagement, care coordination, and population management.

Through a series of meetings— including two hearings featuring more than 40 testifiers and presentations by experts— the Policy Committee sought to understand the health IT challenges and needs of behavioral health and long-term and post-acute care providers. The Policy Committee developed a draft set of voluntary certification criteria for behavioral health, long-term and post-acute care providers focused on interoperability, privacy and security, and modularity to improve EHR functionality. The workgroup held a listening session in May 2014 to solicit feedback.

#### *Advancing the Privacy and Security of Health Information*

HHS builds consensus recommendations on privacy and security issues through a multi-pronged, flexible, and iterative process for assessing, prioritizing, and implementing privacy and security-related initiatives. HHS solicits feedback on emerging issues and best practices through public roundtables and engagements through specific privacy and security communities on the advisory committees and the National Learning Consortium. HHS combines this knowledge with qualitative analysis of public surveys and government data to determine privacy and security priorities in the health care sector. For example, ONC hosted public hearings on provider and patient identity proofing and authentication related to Stage 2 of the EHR Incentive Programs.

#### *Advancing Health Information Exchange and Interoperability*

As part of the strategy to advance HIE and interoperability, CMS and ONC jointly issued a Request for Information, “Advancing Interoperability and Health Information Exchange,” which specified potential options to accelerate the existing progress in HIE and enhance the market environment.<sup>70</sup> These options could increase HIE across providers, thereby improving the likelihood of successful delivery and payment

reform. HHS received more than 200 submissions from a broad range of stakeholders and wide spectrum of providers, including long-term care, post-acute care, and behavioral health providers and their professional organizations, payers, state-based organizations and agencies, and consumers. In response, HHS released *Principles and Strategy for Accelerating Health Information Exchange* (Acceleration Paper). ONC used these submissions and the Acceleration Paper to inform the development of the paper: *Putting Health Information in the Hands of the Nation: A Ten Year Vision for Widespread Health IT Interoperability 2014 to 2024*. ONC intends to consider the principles and strategies outlined in the HHS Acceleration Paper as it designs an interoperability roadmap.

## CONCLUSION

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Health care providers across the health care system are adopting and using health IT. Approximately six in ten hospitals (59 percent) and one-half of physicians (48 percent) have adopted basic EHRs. This represents significant increases compared with rates prior to passage of the HITECH Act in 2009. Electronic HIE has also increased. In 2013, more than six in ten hospitals exchanged clinical data with health care providers outside of their system; however, only 14 percent of physicians electronically shared patient health information with outside providers.

Stage 2 of the EHR Incentive Programs should serve as a catalyst for promoting the exchange of clinical information across organizational boundaries and EHR developer platforms. A key requirement of Stage 2 of the EHR Incentive Programs requires eligible professionals and hospitals to provide a summary of care record for more than half of their transitions of care. In addition to the EHR Incentive Programs, HHS will continue to promote the widespread adoption and use of health IT to support better care, better health, and improved efficiency through collaboration with public and private partners, the development and integration of policies and technical standards, and investments to improve health IT usability and safety.

Moving forward, HHS intends to further advance HIE using the principles and strategies outlined in the Acceleration Paper:

- ❖ New HHS regulations and guidance on existing programs that will enable a patient's health information to follow them wherever they access care with appropriate privacy and security safeguards.
- ❖ HHS programs will advance HIE across providers in the continuum of care.
- ❖ HHS will work with stakeholders to develop an interoperability roadmap that improves existing health information networks, and scales approaches for fluidly exchanging health information across vendor platforms to support a broad array of transitions of care and public health.
- ❖ HHS will work to align health IT standards for quality measurement and improvement.

## ❖ APPENDIX 1. EHR Adoption Definitions

The following are definitions used in Figure 1 to demonstrate EHR adoption rates among non-federal acute care hospitals and office-based physicians. The data source for non-federal acute care hospitals is the American Hospital Association (AHA) Annual Survey Information Technology Supplement. The data source for office-based physicians is the National Ambulatory Medical Care Survey and the National Ambulatory Medical Survey, Electronic Health Records Survey conducted by the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC).

**Hospital Adoption of Basic EHR:** Appendix Table 1 defines the electronic functions required for hospital adoption of a Basic system, which a consensus expert panel established.<sup>iii</sup> The panel disagreed on the need to include physician notes and nursing assessments to classify a basic system, so they developed two definitions of Basic EHR adoption (Basic EHR without Notes and Basic EHR with Notes). Since the first stage of the CMS EHR Incentive Programs did not require clinician notes, an earlier ONC Data Brief reported basic EHR without Clinician Notes.<sup>iv</sup> Since clinician notes are a requirement for the second stage,<sup>v</sup> the definition of Basic EHR in this report includes clinician notes as a requirement for at least a Basic EHR system.

**Hospital Possession of Certified EHR:** A certified EHR is EHR technology that has been certified as meeting federal requirements for some or all of the hospital objectives of the CMS EHR Incentive Program. “Possession” of certified EHR technology is considered to be either the physical possession of the medium on which a certified Complete EHR, or certified Modular EHR resides, or a legally enforceable right by an eligible health care provider to access and use, at its discretion, the capabilities of a certified Complete EHR or certified Modular EHR. An eligible health care provider may determine the extent to which it will implement or use these capabilities, which will not affect the provider’s “possession” of the certified Complete EHR or certified EHR Module.

**Physician Adoption of Basic EHR:** A system that has all of the following functionalities: patient history and demographics, patient problem lists, physician clinical notes, comprehensive list of patients' medications and allergies, computerized orders for prescriptions, and ability to view laboratory and imaging results electronically.<sup>vi</sup> Having a comprehensive list of patients' medications and allergies was asked as two separate questions in 2010 (one about medications and the other about allergies), but the questions were collapsed in 2011 and in subsequent years.<sup>vii</sup>

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<sup>iii</sup> Blumenthal D, DesRoches CM, Donelan K, Ferris TG, Jha AK, Kaushal R, et al. Health Information Technology in the United States: The Information Base for Progress. Princeton, NJ: Robert Wood Johnson Foundation; 2006

<sup>iv</sup> Charles D, Furukawa MF, Hufstader M. “Electronic Health Record Systems and Intent to Attest to Meaningful Use among Non-federal Acute Care Hospitals in the United States: 2008-2011” ONC Data Brief, no 1. Washington, DC: Office of the National Coordinator for Health Information Technology. February 2012.

<sup>v</sup> Centers for Medicare & Medicaid Services. [Medicare and Medicaid] EHR Incentive Programs. Available form: <https://www.cms.gov/ehrincentiveprograms>.

<sup>vi</sup> Robert Wood Johnson Foundation. Health information technology in the United States: Where we stand, 2008. 2008.

<sup>vii</sup> Hsiao CJ, Hing E, Socey TC, Cai B. Electronic health record systems and intent to apply for meaningful use incentives among office-based physician practices: United States, 2001–2011. NCHS data brief, no 79. Hyattsville, MD: National Center for Health Statistics. 2011.

**Physician Adoption of Any EHR System:** Obtained from "yes" responses to the question, "Does this practice use electronic medical records or electronic health records (not including billing records)?" In this report, "yes" responses are reported as having any EHR system. In recent years, the terms "electronic medical record" and EHR have been used interchangeably.

**Appendix Table 1.** Electronic Functions Required for Hospital Adoption of Basic EHR Systems

<b>EHR Functions Required</b>	<b>Basic EHR without Clinician Notes (Hospitals)</b>	<b>Basic EHR with Clinician Notes (Hospitals)</b>	<b>Basic EHR with Clinician Notes (Physicians)</b>
<b>Electronic Clinical Information</b>			
Patient demographics	★	★	★
Physician notes		★	★
Nursing assessments		★	
Problem lists	★	★	★
Medication lists	★	★	★
Discharge summaries	★	★	
Advance directives			
<b>Computerized Provider Order Entry</b>			
Lab reports			
Radiology tests			
Medications	★	★	★
Consultation requests			
Nursing orders			
<b>Results Management</b>			
View lab reports	★	★	★
View radiology reports	★	★	★
View radiology images			
View diagnostic test results	★	★	★
View diagnostic test images			
View consultant report			
<b>Decision Support</b>			
Clinical guidelines			
Clinical reminders			
Drug allergy results			
Drug-drug interactions			
Drug-lab interactions			
Drug dosing support			

NOTES: Basic EHR adoption among hospitals requires each function to be implemented in at least one clinical unit

## ❖ APPENDIX 2. Providers Eligible for EHR Incentive Programs

**Source:** U.S. Department of Health and Human Services. Office of the Assistant Secretary for Planning and Evaluation. EHR Payment Incentives for Providers Ineligible for Payment Incentives and Other Funding Study. Washington, D.C. June 2013. Accessed on June 11, 2014 from:

<http://aspe.hhs.gov/daltcp/reports/2013/ehrpj.shtml>

<b>APPENDIX TABLE 2. Eligible Professionals and Eligible Hospitals under the Medicare and Medicaid EHR Incentive Payment</b>		
<b>Eligible Professionals (EP)</b>	<b>Medicare EHR Incentive Program</b>	<b>Medicaid EHR Incentive Program<sup>a</sup></b>
Physicians (MD/DO)	X	X
Dentists/Oral Surgeons (DDS/DMD)	X	X
Podiatrists (DPM)	X	
Optometrists (OD) <sup>b</sup>	X	X
Chiropractors (DC)	X	
Nurse Practitioners (NP)		X
Certified Nurse Midwives (CNM)		X
Physician Assistants (PA) <sup>c</sup>		X
<b>Eligible Hospitals (EH)</b>	<b>Medicare EHR Incentive Program</b>	<b>Medicaid EHR Incentive Program<sup>d</sup></b>
Acute Care Hospital	X	X
Critical Access Hospitals (CAHs) <sup>e</sup>	X	X
Indian Health Service Hospitals <sup>f</sup>	X	X
Children's Hospitals <sup>g</sup>		X
Cancer Hospitals		X
Territory Hospitals		X

a. Medicaid EHR Incentive Program Patient Volume Adjustment: Eligible Professionals: Have at least 30% of patient volume attributable to Medicaid patients (20% for pediatricians) or practice predominantly in an FQHC or RHC with at least 30% of patient volume attributable to "needy individuals." "Needy individuals" is defined as patients who are enrolled in the Medicaid or CHIP, receive uncompensated care, or receive care on a reduced fee scale.

b. The CMS EHR Incentive Program final rule clarifies that optometrists are Medicaid eligible professionals in states where the State Plan explicitly says that "the term "physicians' services" includes services of the type which an optometrist is legally authorized to perform."

c. Physician assistants are only eligible for Medicaid EHR incentive payments when practicing in a physician assistant-led FQHC or RHC.

d. Medicaid EHR Incentive Program Patient Volume Thresholds: Eligible Hospitals: Acute care hospitals (including CAHs and cancer hospitals) with at least 10% of patient volume attributable to Medicaid patients. Children's hospitals (no Medicaid patient volume requirements).

e. Although CAHs are eligible to receive EHR incentive payments, they are not included in the definition of "eligible hospital" under 42 C.F.R. §495.100 for purposes of the EHR incentive payments under Medicare.

f. Indian Health Service (IHS) provides directly or under contract a variety of health such as physician, hospital, dental, and other services. IHS is the payer of last resort; primary payers include Medicare A and B and Medicaid. Some IHS providers (e.g., nursing home, HHA providers) are ineligible for EHR incentives. These ineligible provider types are integrated within the ineligible providers addressed throughout this report.

g. CMS Medicare and Medicaid EHR Incentive Rule--Stage 2 Final Rule. "We proposed to revise the definition of a children's hospital in §495.302 to also include any separately certified hospital, either freestanding or hospital within hospital that predominately treats individuals under 21 years of age; and does not have a CMS certification number because they do not serve any Medicare beneficiaries but has been provided an alternative number by CMS for purposes of enrollment in the Medicaid EHR Incentive Program. We will provide future guidance on how to obtain these alternative numbers. The only comments we received on this proposal were favorable. We are finalizing these policies as proposed. Guidance to these hospitals and the states on enumeration and determining eligibility is also forthcoming." <http://www.gpo.gov/fdsys/pkg/FR-2012-09-04/pdf/2012-21050.pdf>.

### ❖ APPENDIX 3. Providers Not Eligible for EHR Incentive Programs

**Source:** U.S. Department of Health and Human Services. Office of the Assistant Secretary for Planning and Evaluation. EHR Payment Incentives for Providers Ineligible for Payment Incentives and Other Funding Study. Washington, D.C. June 2013. Accessed on June 11, 2014 from:

<http://aspe.hhs.gov/daltcp/reports/2013/ehrpj.shtml>

APPENDIX TABLE 3. Ineligible Providers by Cluster in Alphabetical Order <sup>a</sup>			
Long-Term & Post-Acute Care (LTPAC)	Behavioral Health (BH)	Safety Net Providers (FQHC & RHC)	Other
<ul style="list-style-type: none"> <li>• Home health agency (HHA)</li> <li>• Hospice</li> <li>• Inpatient rehabilitation facility (IRF)</li> <li>• Intermediate care facility for individuals with intellectual disabilities (ICF/IID)</li> <li>• Long-term care hospital (LTCH)</li> <li>• Nursing home (SNF/NF)</li> </ul>	<ul style="list-style-type: none"> <li>• Clinical social worker</li> <li>• Community mental health center (CMHC)</li> <li>• Psychiatric hospital/unit (including substance abuse)</li> <li>• Residential treatment centers (facilities for mental health and/or substance abuse)</li> <li>• Clinical psychologist</li> </ul>	<ul style="list-style-type: none"> <li>• Federally qualified health center (FQHC)</li> <li>• Rural health clinic (RHC)</li> </ul>	<ul style="list-style-type: none"> <li>• Ambulatory surgical center (ASC)</li> <li>• Blood center</li> <li>• Renal dialysis facility</li> <li>• Laboratory</li> <li>• Dietitian/nutritional professional</li> <li>• Pharmacist</li> <li>• Pharmacy</li> <li>• Therapist (physical, occupational, speech)</li> </ul>
<p>a. The focus of this report is on providers identified in PHSA §3000(3). We acknowledge that there are other important providers (e.g., assisted living) and programs (e.g., home and community-based services) in the LTPAC community, and similarly other important provider types/services offered in the Behavioral Health Cluster. However, the focus of this study is limited to the health care provider types listed in §3000(3) of the PHSA and who could participate in the Medicare or Medicaid programs</p>			

## NOTES

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- <sup>1</sup> Jones SS, Rudin, RS, Shekelle PG, Shanman,R, Timmer M, Motala A, PerryTR. Health Information Technology: An Updated Systematic Review with a focus on Meaningful Use Functionalities. Prepared by Southern California Evidence Based Practice Center under Contract No. HHSP23337020T. Washington, D.C. January 2014. [http://healthit.gov/sites/default/files/systematic\\_review\\_final\\_report\\_508\\_compliant.pdf](http://healthit.gov/sites/default/files/systematic_review_final_report_508_compliant.pdf)
- <sup>2</sup> Hsiao C-J, Hing E. Use and characteristics of electronic health record systems among office-based physician practices: United States, 2001–2013. NCHS data brief, no 143. Hyattsville, MD: National Center for Health Statistics. 2014. <http://www.cdc.gov/nchs/data/databriefs/db143.htm>
- <sup>3</sup> Charles D, Gabriel M, Furukawa MF. Adoption of Electronic Health Record Systems among U.S. Non-federal Acute Care Hospitals: 2008-2013. ONC Data Brief, no. 16. Washington, DC: The Office of the National Coordinator for Health Information Technology. May 2014. <http://healthit.gov/sites/default/files/oncdatabrief16.pdf>
- <sup>4</sup> Gabriel MH, Furukawa MF, Jones EB, King J, Samy LK. The Implementation and Use of Electronic Health Records to Achieve Meaningful Use among Critical Access Hospitals. ONC Data Brief No. 12. Washington, DC: The Office of the National Coordinator for Health Information Technology, September 2013. [http://healthit.gov/sites/default/files/cahdata\\_brief12.pdf](http://healthit.gov/sites/default/files/cahdata_brief12.pdf)
- <sup>5</sup> Jones EB, Furukawa MF. Adoption and use of electronic health records among federally qualified health centers grew substantially during 2010-12. *Health Aff (Millwood)*. 2014;33(7):1254-61.
- <sup>6</sup> Medicare and Medicaid Programs; Electronic Health Record Incentive Program; Final Rule, 75 Fed. Reg. 44,314 July 28, 2010. [http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Meaningful\\_Use.html](http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Meaningful_Use.html)
- <sup>7</sup> Jamoom EW, Patel VP, Furukawa MF, King, J. EHR adopters vs. non-adopters: Impacts of, barriers to, and federal initiatives for EHR adoption. *Healthcare*. 2014.2(1): 33–39 <http://www.sciencedirect.com/science/article/pii/S2213076413000845>
- <sup>8</sup> Ibid., Jamoom
- <sup>9</sup> U.S. Department of Health and Human Services. Office of the Assistant Secretary for Planning and Evaluation. EHR Payment Incentives for Providers Ineligible for Payment Incentives and Other Funding Study. Washington, D.C. June 2013. <http://aspe.hhs.gov/daltcp/reports/2013/ehрпи.shtml>
- <sup>10</sup> Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report (MMWR), December 13, 2013 / 62(49);1018-1018. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6249a8.htm>
- <sup>11</sup> National Council for Community Behavioral Healthcare. HIT Adoption and Readiness for Meaningful Use in Community Behavioral Health: Report on the 2012 National Council Survey. <http://www.thenationalcouncil.org/wp-content/uploads/2012/10/HIT-Survey-Full-Report.pdf>
- <sup>12</sup> Government Accountability Office. GAO, Electronic Health Records: Number and Characteristics of Providers Awarded Medicare Incentive Payments for 2011-2012, GAO-14-21R. Washington, D.C.: October 24, 2013. <http://www.gao.gov/assets/660/658534.pdf>
- <sup>13</sup> Heisey-Grove D, Danehy LN, Consolazio M, Lynch K, Mostashari F. A national study of challenges to electronic health record adoption and meaningful use. *Med Care*. 2014 ;52(2):144-8.
- <sup>14</sup> NORC at the University of Chicago. Final Report: Evaluation of Information Technology Professional in Health Care “Workforce” Program. Washington, D.C. March 2014. <http://healthit.gov/sites/default/files/workforceevaluationsummative-report.pdf>
- <sup>15</sup> DesRoches CM, Charles D, Furukawa MF, Joshi MS, Kralovec P, Mostashari F, Worzala C, Jha AK. Adoption of Electronic Health Records Grows Rapidly, But Fewer Than Half of US Hospitals Had At Least A Basic System in 2012. *Health Aff (Millwood)*. 2013 Aug;32(8):1478-85.

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- <sup>16</sup> Ibid., U.S. Department of Health and Human Services. Office of the Assistant Secretary for Planning and Evaluation.
- <sup>17</sup> Ibid., U.S. Department of Health and Human Services. Office of the Assistant Secretary for Planning and Evaluation.
- <sup>18</sup> The Office of the National Coordinator for Health Information Technology. Certification Guidance for EHR Technology Developers Serving Health Care Providers Ineligible for Medicare and Medicaid EHR Incentive Payments. [http://www.healthit.gov/sites/default/files/generalcertexchange\\_guidance\\_final\\_9-9-13.pdf](http://www.healthit.gov/sites/default/files/generalcertexchange_guidance_final_9-9-13.pdf)
- <sup>19</sup> To learn more, visit: <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Delivery-Systems/Grant-Programs/TEFT-Program-.html>
- <sup>20</sup> Williams AB. Issue Brief: Behavioral Health and Health IT. ONC Issue Brief. Washington, DC: The Office of the National Coordinator for Health Information Technology, September 2013. [http://www.healthit.gov/sites/default/files/bhandhit\\_issue\\_brief.pdf](http://www.healthit.gov/sites/default/files/bhandhit_issue_brief.pdf)
- <sup>21</sup> Holman H, Lorig K. Patients as partners in managing chronic disease. Partnership is a prerequisite for effective and efficient health care. *BMJ*. 2000;320(7234):526–7.
- <sup>22</sup> Hibbard J, Mahoney E, Stock R, Tusler M. Do increases in patient activation result in improved self-management behaviors? *Health Serv Res*. 2007;42(4):1443–63.
- <sup>23</sup> Mosen DM, Schmittiel J, Hibbard J, Sobel D, Remmers C, Bellows J. Is patient activation associated with outcomes of care for adults with chronic conditions? *J Ambul Care Manage*. 2007;30(1):21–9.
- <sup>24</sup> Swain M, Patel V. Patient Access to Test Results among Clinical Laboratories. ONC Data Brief, no 13. Washington, DC: The Office of the National Coordinator for Health Information Technology. February 2014. <http://healthit.gov/sites/default/files/onc-data-brief-13-labsurveydatabrief.pdf>
- <sup>25</sup> Department of Health and Human Services. Centers for Medicare & Medicaid Services. Final Rule: 79 Fed. Reg. 7,27289 (February 6, 2014).. <https://www.federalregister.gov/articles/2014/02/06/2014-02280/patientsaccess-to-test-reports-clia-program-and-hipaa-privacy-rule>
- <sup>26</sup> See <http://bluebuttonconnector.healthit.gov> to learn which data holders are offering electronic access to personal health data by consumers.
- <sup>27</sup> Jones SS, Health Information Technology: An Updated Systematic Review with a focus on Meaningful Use Functionalities. [http://healthit.gov/sites/default/files/systematic\\_review\\_final\\_report\\_508\\_compliant.pdf](http://healthit.gov/sites/default/files/systematic_review_final_report_508_compliant.pdf)
- <sup>28</sup> The Office of the National Coordinator for Health Information Technology: Health Information Technology Patient Safety Action and Surveillance Plan. July 2, 2013. [http://www.healthit.gov/sites/default/files/safety\\_plan\\_master.pdf](http://www.healthit.gov/sites/default/files/safety_plan_master.pdf)
- <sup>29</sup> Institute of Medicine, Health IT and Patient Safety: Building Safer Systems for Better Care, 2011.
- <sup>30</sup> Department of Health and Human Services. Final Rule. 77 Fed. Reg...54,163 (September 4, 2012).. <https://www.federalregister.gov/articles/2012/09/04/2012-20982/health-information-technology-standards-implementation-specifications-and-certification-criteria>
- <sup>31</sup> Turf. EHR Usability Toolkit. <https://sbmi.uth.edu/nccd/turf/>
- <sup>32</sup> University of Maryland’s Human-Computer Interaction Lab. <http://www.cs.umd.edu/hcil/sharp/>
- <sup>33</sup> Food and Drug Administration. FDASIA Health IT Report: Proposed Strategy and Recommendations for a Risk-Based Framework. April 2014. <http://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofMedicalProductsandTobacco/CDRH/CDRHReports/UCM391521.pdf>
- <sup>34</sup> Section 618 of the Food and Drug Administration Safety and Innovation Act (FDASIA), Public Law 112-144, requires that the FDA, in consultation with ONC and FCC, develop and post on their respective web sites “a report that contains a proposed strategy and recommendations on an appropriate, risk-based regulatory

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framework pertaining to health information technology, including mobile medical applications, that promotes innovation, protects patient safety, and avoids regulatory duplication.”

- <sup>35</sup> The Office of the National Coordinator for Health Information Technology. Beacon Community Program’s Learning Guides. <http://www.healthit.gov/policy-researchers-implementers/beacon-community-program/learning-guides>
- <sup>36</sup> To learn more, visit: <http://healthit.ahrq.gov/ahrq-funded-projects/health-information-technology-value-rural-hospitals>
- <sup>37</sup> Felt-Lisk S, Ferry G, Roper R, Au M, Walker J, Jones JB, Lerch S. Sustainability, Partnerships, and Teamwork in Health IT Implementation: Essential Findings From the Transforming Healthcare Quality Through IT Grant. (Prepared by Mathematica Policy Research and Geisinger Health System, under Contract No. HHS 290200900019I). AHRQ Publication No. 12-0075-EF. Rockville, MD: Agency for Healthcare Research and Quality. December 2012. <http://healthit.ahrq.gov/sites/default/files/docs/page/SustainabilityTeamworkFINALFORWEB.pdf>
- <sup>38</sup> Arora S, Thornton K, Murata G, Deming P, Kalishman S, Dion D, Parish B, Burke T, Pak W, Dunkelberg J, Kistin M, Brown J, Jenkusky S, Komaromy M, Qualls C. Outcomes of Treatment for Hepatitis C Virus Infection by Primary Care Providers. *N Engl J Med.* 2011; 364:2199-2207
- <sup>39</sup> See IEEE Standard Computer Dictionary: A Compilation of IEEE Standard Computer Glossaries (New York, NY: 1990).
- <sup>40</sup> Williams C, Mostashari F, Mertz K, Hogin E, Atwal P. From the Office of the National Coordinator: the strategy for advancing the exchange of health information. *Health Aff (Millwood).* 2012;31(3):527-36
- <sup>41</sup> Furukawa MF, Patel V, Charles D, Swain M, Mostashari F. Hospital electronic health information exchange grew substantially in 2008-12. *Health Aff (Millwood).* 2013;32(8):1346-54.
- <sup>42</sup> Furukawa MF, King J, Patel V, Hsiao CJ, Adler-Milstein J, Jha AK. Despite Substantial Progress In EHR Adoption, Health Information Exchange And Patient Engagement Remain Low In Office Settings. *Health Aff (Millwood).* August 2014.
- <sup>43</sup> Gabriel MH, Swain M. E-Prescribing Trends in the United States. ONC Data Brief, no.18. Washington, DC: The Office of the National Coordinator for Health Information Technology, July 2014. <http://healthit.gov/sites/default/files/oncdatabriefe-prescribingincreases2014.pdf>
- <sup>44</sup> Swain M, Charles D, Furukawa MF. Health Information Exchange among U.S. Non-federal Acute Care Hospitals: 2008-2013. ONC Data Brief, no 17. Washington, DC: The Office of the National Coordinator for Health Information Technology. May 2014. [http://healthit.gov/sites/default/files/oncdatabrief17\\_hieamonghospitals.pdf](http://healthit.gov/sites/default/files/oncdatabrief17_hieamonghospitals.pdf)
- <sup>45</sup> The Office of the National Coordinator for Health Information Technology. Percent of Hospitals Able to Send and Receive Secure Electronic Messages Containing Patient Health Information to and from External Sources, Health IT Quick-Stat, no. 27. April 2014. <http://dashboard.healthit.gov/quickstats/pages/FIG-Hospital-Capability-Secure-Electronic-Messaging.html>
- <sup>46</sup> The Office of the National Coordinator for Health Information Technology. U.S. Hospitals' Capability to Electronically Query Patient Health Information from Outside Their Organization and System, Health IT Quick-Stat, no. 25. April 2014. <http://dashboard.healthit.gov/quickstats/pages/FIG-Hospital-Electronic-Query-Capability.html>
- <sup>47</sup> Swain M, Patel V. Health Information Exchange among Clinical Laboratories. ONC Data Brief, no 14. Washington, DC: The Office of the National Coordinator for Health Information Technology. February 2014. [http://www.healthit.gov/sites/default/files/onc-data-brief-14-testresultexchange\\_databrief.pdf](http://www.healthit.gov/sites/default/files/onc-data-brief-14-testresultexchange_databrief.pdf)
- <sup>48</sup> Wolf L, Harvell J, Jha A. Hospitals Ineligible for Federal Meaningful-Use Incentives Have Dismally Low Rates of Adoption of Electronic Health Records. *Health Aff (Millwood).* 2012 Mar;31(3):505-13.

- 
- <sup>49</sup> Gage B, Morley M, Ingber M, Smith L. Post-Acute Care Episode Expanded Analytic File (“Longitudinal Project”). April 2011 – Final Report. <http://aspe.hhs.gov/health/reports/2011/pacexpanded/index.shtml>
- <sup>50</sup> The Office of the National Coordinator for Health Information Technology. Percent of U.S. Hospitals that Routinely Electronically Notify Patient's Primary Care Provider upon Emergency Room Entry, Health IT Quick-Stat, no. 26. April 2014. <http://dashboard.healthit.gov/quickstats/pages/FIG-Hospital-Routine-Electronic-Notification.html>
- <sup>51</sup> Furukawa MF, Despite Substantial Progress In EHR Adoption, Health Information Exchange And Patient Engagement Remain Low In Office Settings.
- <sup>52</sup> JASON – The MITRE Corporation. A Robust Health Data Infrastructure. Accessed June 11, 2014 from: [http://healthit.gov/sites/default/files/ptp13-700hhs\\_white.pdf](http://healthit.gov/sites/default/files/ptp13-700hhs_white.pdf)
- <sup>53</sup> U.S. Department of Health and Human Services. Principles and Strategies for Accelerating Health Information Technology. August 2013. Accessed September 3, 2014 from: [http://healthit.gov/sites/default/files/acceleratinghieprinciples\\_strategy.pdf](http://healthit.gov/sites/default/files/acceleratinghieprinciples_strategy.pdf)
- <sup>54</sup> McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, DeCristofaro A, Kerr EA., The quality of health care delivered to adults in the United States. *N Engl J Med.* 2003. 26;348(26):2635-45
- <sup>55</sup> Rosenbaum, R., Data Governance and Stewardship: Designing Data Stewardship Entities and Advancing Data Access. *Health Serv Res.* 2010 Oct;45(5 Pt 2):1442-55.
- <sup>56</sup> The Office of the National Coordinator for Health IT. Connecting Health and Care for the Nation: A 10-year Vision to Achieve an Interoperable Health IT Infrastructure. June 2014. Access September 3, 2014 from: <http://healthit.gov/sites/default/files/ONC10yearInteroperabilityConceptPaper.pdf>
- <sup>57</sup> To learn more, visit: <http://www.healthit.gov/providers-professionals/patient-consent-electronic-health-information-exchange/meaningful-consent-overview>
- <sup>58</sup> The Office of the National Coordinator for Health IT. Connecting Health and Care for the Nation: A 10-year Vision to Achieve an Interoperable Health IT Infrastructure. <http://healthit.gov/sites/default/files/ONC10yearInteroperabilityConceptPaper.pdf>
- <sup>59</sup> Centers for Medicare & Medicaid Services. CMS Answers to Frequently Asked Questions: September 9, 2013. <http://www.medicare.gov/Federal-Policy-Guidance/downloads/FAQ-09-10-2013.pdf>
- <sup>60</sup> The Office of the National Coordinator for Health Information Technology. Health Information Exchange Governance. <http://healthit.gov/policy-researchers-implementers/health-information-exchange-governance>
- <sup>61</sup> Wu L, Daniel J. Improving Public Health through Health IT. Health IT Buzz Blog, April 2014. <http://www.healthit.gov/buzz-blog/meaningful-use/improving-public-health-health/>
- <sup>62</sup> Wu L. Issue Brief: Health IT for Public Health Reporting and Information Systems. The Office of the National Coordinator for Health IT. April 2014. <http://www.healthit.gov/sites/default/files/phissuebrief04-24-14.pdf>
- <sup>63</sup> The Office of the National Coordinator for Health Information Technology. Majority of Primary Care Physicians Able to Submit Electronic Immunization Data to Local Public Health Agencies, Health IT Quick-Stat, no. 28. April 2014. <http://dashboard.healthit.gov/quickstats/pages/FIG-Percent-Medicare-Eligible-Primary-Care-Physicians-Selecting-Immunization-Measure.html>
- <sup>64</sup> The Office of the National Coordinator for Health Information Technology. Percent of All Eligible Hospital Public Health Measure Attestations, Health IT Quick-Stat, no. 16. February 2014. <http://dashboard.healthit.gov/quickstats/pages/FIG-MU-Hospitals-Public-Health-Measure-Attestations.html>
- <sup>65</sup> Centers for Disease Control and Prevention. Fiscal Year 2015 Justification of Estimates for Appropriation Committees. [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2015\\_CJ\\_CDC\\_FINAL.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2015_CJ_CDC_FINAL.pdf)
- <sup>66</sup> Ibid., Centers for Disease Control and Prevention.

- 
- <sup>67</sup> Centers for Disease Control and Prevention. Progress in Increasing Electronic Reporting of Laboratory Results to Public Health Agencies — United States, 2013. MMWR 2013;62:38. 797-799.  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6238a5.htm>
- <sup>68</sup> The Office of the National Coordinator for Health Information Technology. Health IT Policy Committee: Recommendations to the National Coordinator for Health Information Technology.  
<http://www.healthit.gov/FACAS/health-it-policy-committee/health-it-policy-committee-recommendations-national-coordinator-health-it>
- <sup>69</sup> The Office of the National Coordinator for Health Information Technology. Health IT Standards Committee: Recommendations to the National Coordinator for Health Information Technology.  
<http://www.healthit.gov/facas/health-it-standards-committee/health-it-standards-committee-recommendations-national-coordinator>
- <sup>70</sup> Department of Health and Human Services. Advancing Interoperability and Health Information Exchange. Notice with comment;. Request for Information, 78 Fed.Reg.14,714793 (March 7, 2013)..  
<http://www.gpo.gov/fdsys/pkg/FR-2013-03-07/pdf/2013-05266.pdf>