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Obtaining Providers' 'Buy-In' And Establishing Effective Means Of Information Exchange Will Be Critical To HITECH's Success

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ABSTRACT In enacting the Health Information Technology for Economic and Clinical Health (HITECH) provisions of the American Recovery and Reinvestment Act, Congress set ambitious goals for the nation to integrate information technology into health care delivery. The provisions called for the electronic exchange of health information and the adoption and meaningful use of health information technology in health care practices and hospitals. We examined the marketplace and regulatory forces that influence HITECH's success and identify outstanding challenges, some beyond the provisions' control. To reach HITECH's goals, providers and patients must be persuaded of the value of health information exchange and support its implementation. Privacy concerns and remaining technical challenges must also be overcome. Achieving HITECH's goals will require well-aligned incentives, both visionary and practical pursuit of exchange infrastructure, and realistic assumptions about how quickly such wholesale change can be accomplished. The use of metrics to show adoption proceeding at a reasonable pace, increased flow of data across parties, and evidence that care is improving, at least in areas with robust systems, will be essential to persuade stakeholders that the initiative is progressing well and warrants continued investment.

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Congress has set ambitious goals for rapid nationwide adoption of electronic health records and electronic exchange of health information. The aim is to achieve "meaningful use" of the technology to improve health care outcomes, efficiency, and population health.[1–3]

The Health Information Technology for Economic and Clinical Health (HITECH) provisions of the American Recovery and Reinvestment Act of 2009 are being implemented within the context of a diverse health delivery marketplace and complex regulatory environment. However well conceived, HITECH's provisions will succeed only if they address the underlying drivers of—and barriers to—the changes spelled out in the act.

Many influences driving responses to the provisions are beyond the control of the legislation or those implementing it. Yet they will strongly influence the adoption of health information technology, the flow of clinical data, the technology's meaningful use nationwide, and ultimately HITECH's success in changing health care delivery to improve quality and outcomes.

In this paper we look broadly at the drivers of key initial changes sought by HITECH; consider the influences on them; and distinguish between those that HITECH addresses directly and those that, although likely to be important, are beyond the parameters of the provisions. Understanding the interdependencies between HITECH's programs and policies and this broader context is important for several reasons. First, without

such analysis, the response to HITECH cannot be understood. Second, such analysis can identify challenges and help set priorities across a large number of competing needs.

We consider the adoption of electronic health records and health information exchange in turn, identifying where the locus of decision making rests for each, the key factors driving decision making and how HITECH addresses them, and what remains unaddressed. We end by examining the implications of the analysis for the ability of HITECH to meet its ultimate goals.

Adopting Electronic Health Records

HITECH's success will require the wholesale introduction of electronic health records into provider systems that previously made limited use of them. In 2009 only 11.9 percent of hospitals made any use of electronic health records, and analysts estimated that only 2 percent could meet all stage 1 meaningful-use criteria included in the initial draft federal regulations.[4] Only 21.8 percent of office-based physicians met study criteria for "basic" systems, and only 6.9 percent had what analysts defined as "fully functional systems." Office-based physicians' use of electronic health records also varied widely by geography and type of practice.[5]

The Congressional Research Service anticipates that the incentives created by HITECH will spur dramatic growth in electronic health records, with 70 percent of hospitals and 90 percent of physicians using them by 2019. Absent the HITECH provisions, the Congressional Research Service estimated that hospital and physician use of electronic health records would be 45 percent and 65 percent, respectively.[6] Data for 2011 showed encouraging increases in the share of providers using electronic health record systems, but the 2019 goals remain ambitious.[7]

In America's market-driven health sector, each provider practice or organization decides for itself whether it makes sense to employ an electronic health record system. Decisions may differ by provider setting, locale, specialty, and revenue source. Physicians affiliated with hospitals or in integrated systems will be affected by the decisions of their affiliates, whether or not they agree with them. Many organizations and individuals therefore must be persuaded that electronic health records make sense.

Drivers Of Electronic Health Record Adoption

The literature suggests that four main drivers influence providers' decisions on electronic health records: affordability; product availability; practice integration; and provider attitudes (Exhibit 1). HITECH addresses the first three, but providers' attitudes, critical to the success of the act, are beyond the legislation's control.

AFFORDABILITY Surveys show that providers' willingness to adopt electronic health records is influenced by direct and indirect cost considerations. Direct costs include system acquisition, implementation, and ongoing maintenance, while indirect costs include short- and long-term effects on productivity and practice revenue.[4,8]

Large health care systems and practices can absorb the costs and can benefit quickly from the information flow generated by electronic health records because they internalize a sizable share of health services.[9] Primary care practitioners are an important priority group under the act, but this group faces declining real income, demanding workloads, and capacity constraints that may slow the adoption of electronic health records.[10] Safety-net providers historically experience greater capital constraints and consequently have lower rates of adopting electronic health records.[11,12]

The dominance of fee-for-service payment generally impedes electronic health record adoption because it pays for services, not capacity. Electronic health records can be attractive to fee-for-service providers because the technology can facilitate compliance with documentation guidelines for coding office visits, thus increasing practice revenue for services delivered.[13] However, such use of electronic health records for revenue maximization in a fee-for-service environment is different from meaningfully using data to support care coordination, clinical decision making, and population health.[14]

▶ **WHAT HITECH DOES:** HITECH addresses the financial barrier by authorizing up to $27 billion in Medicare and Medicaid incentive payments over ten years for eligible providers who employ electronic health records and demonstrate meaningful use of health information technology.[15] The act also funds regional extension centers nationwide to provide local support to identified "high-priority" providers—namely, those in small practices or serving disadvantaged populations—by helping them adopt health technology and meet meaningful-use requirements.

HITECH also provides support for community health centers, including capital contributions for systems. Ultimately, nonadopters will face penalties. The goal is to involve enough providers to reach a "tipping point" that creates self-reinforcing momentum leading to broad-based adoption.[16,17]

▶ **REMAINING ISSUES:** These incentives should make electronic health records more af-

EXHIBIT 1

Key Drivers Of Electronic Health Record (EHR) Adoption

Driver	Baseline concerns	HITECH contribution	Remaining issues
Affordability	Financing for providers to implement and operate EHRs, especially in smaller practices with limited access to capital and infrastructure	Medicare/Medicaid incentives; regional extension center support for high-priority providers; related federal program grants for infrastructure	Effective and timely implementation; cash-flow issues; alignment of other payers and revenue; providers' perceptions of the long-term cost of EHRs (business case)
Product availability and support	Absence of national government standards and mechanisms to determine if products meet requirements	National standards and certification bodies; funds for workforce training	Number of certified products available and relevance to different practice forms; provider decision making in a fragmented and changing product market; timing and location of available workforce
Practice integration	How to integrate EHRs into practice workflow to support meaningful use	Regional extension center support; workforce programs; meaningful-use requirements to guide certification and incentives	Available skilled workforce; short-term disruption; support capacity (extension centers or vendors); provider understanding of meaningful use and perceptions about professional standards of care
Providers' attitudes	Providers essentially in driver's seat: attitudes vary with perception of factors above and characteristics (such as age, time to retirement, and practice setting)	No direct contribution, although regional extension centers provide education	Perceived business case now and in the future as health care delivery and payment evolve; attitude of key local and national "influentials"; perceived feasibility, safeguards, likely interoperability; patient support

SOURCE Authors' analysis.

fordable for eligible providers, but they can work only if they are implemented effectively and providers respond to them. In addition, only providers serving Medicare or Medicaid patients can receive incentives, and some provider types (such as selected mental health professionals) are not eligible.

The government developed an online system that eligible hospitals and providers can use to sign up for the program. By October 2011, $1.2 billion in incentive payments had been made, more than $500 million by Medicare and $700 million by Medicaid.[18]

The initial pace of payments through 2011 has been slower than hoped, although levels had begun to rise toward the end of 2011. Implementing Medicaid payments also has been challenging for some states. By early November 2011 the Centers for Medicare and Medicaid Services had approved systems in thirty-six states for Medicaid incentives, and twenty-two states had made at least some payments.[19] Such payments complement Medicare payments to hospitals and provide a more generous alternative to Medicare for eligible professionals.

It is not clear that the incentives will be large enough to overcome financial barriers, particularly for smaller practices and providers with limited access to capital and concerns about cash flow. Providers vary in their dependence on Medicare and Medicaid; whether or not private payers step up with incentives aligned to those of public payers may make a large difference in some providers' response to HITECH. Ultimately, providers must see a long-term business case for adoption, with short-term implementation costs and efficiency losses offset by enhanced productivity, care delivery capacity, and long-term revenue growth.

PRODUCT AVAILABILITY AND SUPPORT Providers can adopt electronic health records only if certified products are available, relevant to providers' needs, and easily supported. Historically, such products have been more readily available for large provider systems than for small, office-based practices.

These products also have used proprietary platforms and often lacked functionalities critical for clinical management and desired delivery reforms, such as medical homes.[20,21] They did not meet the needs of diverse providers, such as those treating children or patients with condi-

tions such as HIV or mental health conditions that make confidentiality a particular concern. If products designed to meet primary care physicians' needs do not meet the needs of the specialists caring for the same patients, the overall value of the systems is diminished.

▶ **WHAT HITECH DOES:** HITECH seeks to enhance compatibility across vendors' products and reassure providers that if they use a certified product, that will allow them to meet minimum standards for meaningful-use payments. The act substitutes national standards for previously voluntary efforts to establish interoperability and product certification requirements. Here, too, regional extension centers offer additional assistance to high-priority providers (small practices or those serving disadvantaged populations) that seek to identify suitable products.

▶ **REMAINING ISSUES:** Certification requirements work only if certified products and trained personnel to support them are available, and only if providers trust the value of certification. The federal government has established certification standards consistent with meaningful-use requirements. It has also created a temporary certification program that, by late 2011, had approved more than 1,300 certified products from more than 600 vendors, including almost 900 ambulatory care products.[22]

However, it's possible that not all product upgrades have been certified. If they haven't been, that could delay some providers' ability to meet meaningful-use requirements. It also is too soon to tell how providers view certification. Many may wonder whether certification guarantees functionalities for stage 1 meaningful use and whether products can be upgraded to handle future, as yet unspecified, requirements.

Also, technology changes rapidly, raising questions about potential misalignments between the evolving market and regulatory requirements, which often change slowly and lack flexibility. The quantity and quality of support by vendors and extension centers also remains unknown, even with federal HITECH support.

PRACTICE INTEGRATION Electronic health records with the functionalities sought by HITECH affect virtually every aspect of a provider's practice, including prescription writing, handling of laboratory results, and creation of clinical notes.[8] Although health technology may be critical to long-term delivery reform, short-term disruptions in practice and revenue are inevitable.

Those experienced in electronic health record adoption report that substantial cultural change is associated with such systems. Systems must accommodate the unique personalities involved, and they require clinical champions and hands-on training for medical staff.[23,24]

Many providers—particularly those in small practices—lack the knowledge, skills, or time needed to implement such systems and redesign their practices to accommodate them. Furthermore, the labor force does not now have enough people who combine solid knowledge of health information technology with operational insight into the effective use of electronic health records in different settings.[25]

▶ **WHAT HITECH DOES:** Regional extension centers are created to support small practices and those serving disadvantaged communities in implementation and practice redesign. HITECH also funds technical assistance contractors to help centers learn from one another.

HITECH addresses workforce needs associated with such systems through a series of interrelated programs that emphasize short-term, nondegree training in core competencies at community colleges. University-based programs are funded to develop personnel who can take on higher-level responsibilities.

▶ **REMAINING ISSUES:** HITECH's timeline means that implementation is proceeding on many fronts simultaneously. Since enactment, sixty-two regional extension centers have been established nationwide. The Office of the National Coordinator for Health Information Technology announced that the centers had met an initial goal of recruiting 100,000 primary care providers nationwide who wanted to use electronic health records and are now engaged in helping those providers meet meaningful-use requirements.[26]

By October 2011 more than 10,000 students were enrolled in HITECH-funded programs at community colleges to learn skills critical for applying health information technology, and more than 5,700 students had completed their studies.[27] However, workforce shortages could limit support to providers who have acquired systems and now seek to integrate them into their practices.

In any case, prior experience shows that human, as much as technical, concerns will influence success, and this is hard to address in legislation.

PROVIDERS' ATTITUDES Leadership and buy-in from the provider community is essential to the successful adoption of electronic health records. Like any form of innovation, this is more likely to spread when influential peers become visible early adopters, reducing others' resistance and encouraging them to become adopters, too.[28]

Many physicians work in large organizations, some of which will be more open to change and influence than others. Readiness to adopt an innovation includes both a psychological orientation (change commitment) and belief in one's

capacity (change efficacy).[29] Some older physicians may be less familiar with computer technology and less willing to invest in systems as they near retirement.[30]

Although health professionals may view electronic health records as a way to improve patient-centered care, they also may be concerned that such systems will depersonalize patient interactions, threaten the security and privacy of personal health information, and raise potential legal liabilities.

▶ **WHAT HITECH DOES:** The act addresses providers' concerns only indirectly. Regional extension centers are responsible for educating providers. HITECH funds can be used for provider outreach and to document the experiences of early adopters. The policy and regulatory processes associated with promulgating criteria for stages 2 and 3 meaningful-use requirements, safety and privacy protections, and other related policies also give providers opportunity for feedback.

▶ **REMAINING ISSUES:** Although HITECH can influence providers' decisions on electronic health records, the legislation alone is unlikely to be the driving force. Providers' buy-in will depend on swaying peers and professional organizations, who are in turn influenced by a range of tangible and intangible factors (Exhibit 2). Although HITECH's ability to direct providers' behavior is limited, the legislation gives the government various tools to address their concerns, such as the regional extension center program. Timely and effective implementation of HITECH's policies and programs will maximize impact and is likely to contribute to providers' confidence in undertaking change. Because human factors drive ultimate buy-in, outreach at the national, state, and local levels to professional organizations and influential leaders who become partners in the goals of HITECH will be important influences on providers' reaction.

Exchange Of Health Information

Key goals of HITECH—including enhanced patient care, improved clinical outcomes and population health, and increased system efficiency—cannot be met unless information is not only digitized through well-formulated electronic health records but also exchanged in a timely way across the health delivery system and with patients and the public. Information exchange currently occurs at fairly basic levels, such as via telephone calls, regular mail, and fax. However, data that can be exchanged in computerized and interpretable ways are easier to aggregate and share across multiple users for different purposes.[31]

Such widespread exchange is currently limited, and past initiatives have experienced relatively high failure rates and low impact.[32,33] Rudimentary forms of exchange can support some of HITECH's goals, but it will take considerably more to conceptualize, gain buy-in, and implement the robust system of exchange that the legislation seeks.

The flow of clinical information among providers, patients, and the suppliers of medical goods and services traditionally has depended on the decisions of private parties, guided by national and state laws limiting allowable access and creating ways to protect information from unauthorized use.[34,35] No one party has the authority to create more robust forms of electronic exchange. In the public sector, authority over data exchange, privacy, and security is split between federal and state governments. Successful exchange also ultimately requires that individual providers be willing—and able—to share.

EXHIBIT 2

What Providers Care About In Choosing Electronic Health Records

Area of concern	Specifics of concern
Business case	Costs, offsetting revenue, up-front financing, cash-flow impact, long-term effect on bottom line under current and likely future payment models
Operational feasibility	Ability to integrate with current systems and practices, acceptance by staff, acceptance by patients, support by peers who will exchange comparable data
Professional norms	Relevance of embedded functionality, effects on quality of care, evolving standard of care Privacy and security of identifiable patient data and clinical care
Personal influences	Type of practice, specialty, age and anticipated remaining practice time, attitudes toward change and technology
Long-term strategic importance	Is change inevitable? Will electronic health records prove useful in the long term and support any anticipated changes in delivery? Is this the evolving standard of good care?

SOURCE Authors' analysis based on review of literature.

Drivers Of Health Information Exchange

Separate from the factors that will drive the adoption of electronic health records, there are at least five factors that will drive the development of health information exchange: national standards to harmonize data capable of electronic exchange; privacy and security protections that provide safeguards against inappropriate access to and misuse of data; organizational interfaces that provide the technical support for exchange; access to the technology necessary to relate to these interfaces; and providers' willingness to share the data through exchange (Exhibit 3).

DATA HARMONIZATION The capacity for interoperable health information exchange is limited if data are not captured uniformly, and systems cannot communicate. Yet disagreements have existed on how much uniformity to require, whether it should be centrally mandated or emerge from the market, and what it takes to make uniformity effective.[36,37]

In the absence of national standards, voluntary efforts have emerged.[6] However, voluntary certification has lacked sufficient scope and authority to fully address providers' concerns that technology they invest in today may not meet future needs or requirements. Voluntary standards also may not have the force needed to offset vendors' incentives to differentiate their products to better attract and retain business.

▶ **WHAT HITECH DOES:** To address these concerns, HITECH requires the federal government to adopt national standards, implementation specifications, and certification criteria to enhance the interoperability, functionality, utility, and security of health information. On July 13, 2010, the Department of Health and Human Services released final rules, including product standards that would meet the requirements facing providers seeking stage 1 meaningful-use incentive payments.[38]

A permanent certification infrastructure is being established for use in stages 2 and 3 certification. However, standards await promulgation of future meaningful-use requirements, which are expected to require increasingly sophisticated capture, exchange, and use of health information. The effective date for stage 2 standards, originally 2013, will be delayed a year to allow additional time for providers to meet standards.

▶ **REMAINING ISSUES:** Although initial national standards are an important first step in encouraging interoperability, their current ef-

EXHIBIT 3

Key Drivers Of Health Information Exchange

Driver	Baseline concerns	HITECH contribution	Remaining issues
Data harmonization	Limited common standards, voluntary compliance; vendors benefit by product differentiation; no market leader setting de facto standards	National standards; product certification for meeting standards	Ultimate feasibility of standards and monitoring for compliance; effectiveness of standards in achieving harmonization; vendor support for interoperability
Privacy and security protection	HIPAA protections have gaps; state laws vary and may limit exchange (such as lab data)	HIPAA expanded to include business associates	Conveying federal commitment and reassurance; variability in state laws and complexity of federal structure and state variability create barriers; patients must perceive exchange to have value and be willing to allow it
Organizational interfaces	Very spotty now, most low volume; multiple approaches possible, given US context	Nationwide Health Information Network; State Health Insurance Exchange Program; Direct Project; CONNECT; workforce programs	Current flexible focus is short-term; state support for health information exchange is limited by leadership turnover and resources; long-term vision still to be developed
Access to technology	Broadband not universally available; technology changes	Federal broadband initiative and related support from ARRA	Ability to fill gaps; relevance of certification standards to evolving technology
Provider participation and patient support	"Free rider" phenomenon; confidentiality concerns; competitive concerns	No direct contribution; meaningful-use incentives require some sharing	Achieving a critical mass or "tipping point"

SOURCE Authors' analysis. **NOTES** HIPAA is Health Insurance Portability and Accountability Act. ARRA is American Recovery and Reinvestment Act.

fectiveness and their ability to evolve as technology changes and meaningful-use standards become more demanding remain to be determined. If providers are concerned that technology meeting the current standards might not be easily upgraded to meet future needs, they may be more reluctant to invest in it. Perception, as well as reality, will be important.

PRIVACY AND SECURITY PROTECTION The basic challenge in any interoperable system is to set an appropriate balance between sharing electronic information and safeguarding its flow. Nationally, the Health Insurance Portability and Accountability Act of 1996 established a basic set of security standards and privacy rules addressing this goal, but the act does not address all issues.[6] Some entities, such as business associates of covered entities, are outside the act's purview.

Enforcement of legislated safeguards is always a concern. Conflicts between federal and state policy can lead to legal ambiguity, as illustrated by clinical laboratory experience.[39] Disagreements also remain on how best to balance privacy with interoperability. For example, the Health Insurance Portability and Accountability Act provides for the generation of national unique identification numbers for patients to support exchange, but Congress has prohibited the use of federal funds to develop them because of privacy concerns.

▶ **WHAT HITECH DOES:** HITECH extends the protections in the Health Insurance Portability and Accountability Act to business associates of covered entities and requires the Office of the National Coordinator to report to Congress on approaches to including other uncovered entities. To meet this requirement, federal officials are updating regulations and policy guidance to enhance privacy and security, including establishing a privacy and security working group with consumer input.[40]

▶ **REMAINING ISSUES:** HITECH and federal actions since its enactment seek to address the concerns of different groups and the public at large regarding the adequacy of privacy and security safeguards. However, such processes take time. For example, final federal regulations on business associates had not been finalized by the end of 2011. Legal protections aside, patients as well as providers must value and be willing to consent to exchange of information. Otherwise, meaningful use that requires exchange will be limited.

ORGANIZATIONAL INTERFACES For data exchange, mechanisms must exist to support its flow across diverse providers, systems, and locations.[41] To support population-based health interventions and research, it must also be possible to aggregate data. Consensus on appropriate models for exchange and aggregation has been limited.[42] Efforts to create systems of exchange have experienced as many failures as successes because of poor execution, the weakness of the business case for geographically based exchange organizations, lack of broad stakeholder support, privacy and liability concerns, and competitive pressures.[43–46]

▶ **WHAT HITECH DOES:** HITECH's response to the complex exchange environment includes authority for federal leadership and resources for federal and state governments to promote exchange. However, the legislation has little to say about how responsibilities are to be shared.

At the national level, HITECH expands existing federal authority to support a Nationwide Health Information Network as a common platform for exchange across diverse entities and communities, without defining a specific model to accomplish this objective. The act also creates a State Health Information Exchange Program supporting cooperative agreements among all states and territories to engage multiple stakeholders and develop context-appropriate exchange strategies over the next four years. Emerging state efforts include a variety of models reflecting different previous experiences, capacity, and stakeholder support.[47]

In implementing HITECH, the Department of Health and Human Services has focused first on creating mechanisms to support initial exchange to meet stage 1 meaningful-use requirements. The Office of the National Coordinator asked states to give immediate priority to ensuring that all eligible providers have at least one option available to meet stage 1 requirements.

At the national level, work continues to encourage robust exchange among federal agencies and other selected large organizations. Simultaneously, the department is developing the Direct Project, a simple way for providers to use the Internet for point-to-point exchange on a one-on-one basis—with patients or with a laboratory—so that stage 1 meaningful-use requirements can be met.[48]

▶ **REMAINING ISSUES:** The rationale for focusing federal and state efforts on initial needs is understandable, given the tight schedule for meeting HITECH's expectations of demonstrated results. Focusing on immediate needs may be important for building experience and a path to more robust ultimate exchange. But some fear it gives less priority to addressing essential challenges required for long-term success or reduces the willingness of providers to participate in more robust models of exchange at the state or local level.[48,49] Some providers might not place great economic or clinical value on geo-

graphical versus more system-based exchange.[50] Ultimately, these conflicts must be resolved to develop a consensus on how to move forward.

ACCESS TO TECHNOLOGY Health information exchange relies heavily on the Internet. Internet access is increasingly available in all areas of the country, but ease of access and network speed vary substantially nationwide, as do take-up rates.[51,52] Providers in areas with more restricted service and patients without an Internet connection are likely to face additional challenges in exchanging information.

▶ **WHAT HITECH DOES:** Although HITECH does not address the need for broadband access, Congress has promoted activity to fill these gaps through related legislation. In early 2009 Congress directed the Federal Communications Commission to develop a National Broadband Plan to support a variety of activities, including health care. An interagency working group also was formed to address this issue. The American Recovery and Reinvestment Act included $7.2 billion for broadband grants, loans, and loan guarantees from the Departments of Agriculture and Commerce.

In 2010, grants were made with these funds, and the Federal Communications Commission released the National Broadband Plan, which calls for universal broadband access. In February 2011 President Obama announced a wireless initiative that would expand high-speed Internet access to 98 percent of Americans.[53]

▶ **REMAINING ISSUES:** Despite the achievements noted above, it remains unclear how long it will take to fully address the existing national gaps in broadband access, or how big a problem this will pose in achieving interconnectivity. More generally, the rapidly evolving nature of electronic interchange will be challenging for HITECH because it means that policies needed for standardization to support interoperability also must be flexible enough to accommodate innovation and continued relevance.

PROVIDER PARTICIPATION AND PATIENT SUPPORT Ultimately, health information exchange works only if data are available to be exchanged. Providers historically are reluctant to share identifiable patient data. There also is an inherent circularity to participation: The benefits of exchange come from many providers sharing data, but the costs of initial participation are high relative to benefits if participation is low.

Absent a strong push requiring robust exchange functionality, it may be in the interest of individual providers to wait until enough providers contribute to achieve a "tipping point" that makes sharing more valuable. However, if most providers see it that way, the tipping point will not be achieved.

▶ **WHAT HITECH DOES:** Meaningful-use payments, to the extent that they require exchange, can make it more rewarding for providers to share information. However, because of the previously discussed constraints, stage 1 requires relatively limited exchange.

▶ **REMAINING ISSUES:** Whether meaningful-use incentives will be strong enough to counter provider reluctance to share clinical information is unclear. Participation will depend on how providers perceive the value and timeliness of shared information; their protection from security, privacy, and liability concerns; and whether they view their patients and the public as generally supporting or opposing exchange.

Although HITECH was originally seen as a first step in delivery reform (the "push"), the opposite may also be true. To the extent that providers see delivery reform and quality improvement as key to their ultimate success, such reform may "pull" providers to be more supportive of information exchange.

INFORMATION EXCHANGE: SUMMARY In sum, in contrast to electronic health records—whose drivers can be relatively well distinguished, with accountability for them determined—authority for achieving goals for information exchange is much more ambiguous and diffuse across players. Current efforts provide a short-term vehicle to support initial information exchange, but ultimately structural issues demand technical and political solutions for the robust exchange of health information to occur nationwide. Furthermore, no solution is likely to work if providers are not willing to support it.

Meaningful Use, Improved Outcomes, And Ultimate Challenges

HITECH is a multifaceted initiative that seeks to encourage meaningful use of health information to improve individual- and population-based health outcomes through a variety of avenues.

HITECH IN CONTEXT In many ways, HITECH establishes a vision for the future. Its initial requirements aim to balance ultimate goals with immediate realities and foster a base of activity from which more robust meaningful use can flow in the future.[15]

HITECH authorizes Beacon grants to more advanced communities to develop early evidence that meaningful use will make a difference in patient outcomes. HITECH also funds innovation through SHARP (Strategic Health IT Advanced Research Projects) grants, which support teams of researchers addressing well-documented problems that have impeded the development of health information technology—problems such as security of information,

patients' use of information, system architecture, and use of electronic record data.

HITECH's goals are closely intertwined with those of overall health delivery reform. Specifically, such reform seeks to change health care payment and practice to encourage delivery that is more patient centered, evidence based, and coordinated across settings and is also provided with greater efficiency or at lower cost. Such change will be easier if health information can be electronically communicated on common platforms with appropriate security and privacy protections.

But the converse is also true: External influences on providers—such as health care payment and delivery reforms (both nationally and in many states), professional certification requirements, and peer-group norms—can also create a supportive environment for HITECH.[54] Ideally, alignment of all of these efforts will generate a consistent and compelling message for providers and other key stakeholders that change is inevitable and valued.

IMPLICATIONS FOR IMPLEMENTATION PRIORITIES The analysis presented above highlights the essential interdependence between the actions called for by the HITECH provisions and the legislation's operating environment. Successful implementation of health information technology and information exchange infrastructure and programs to support that technology is important. But it is equally necessary to address drivers of adoption and exchange that are somewhat outside of the legislation's purview, yet critical to its success.

Our analysis reinforces the need for provider support, without which success is impossible. Evidence that it makes business sense to invest in health information technology will go a long way toward addressing providers' concerns, as will endorsements from provider organizations and payers.

Another key concern is public support. Consumers must be assured that the privacy of their confidential clinical information will be protected and that they will benefit from electronic health records in other ways, such as by being able to become more engaged in their care.

EXHIBIT 4

Time Frame For Selected HITECH Programs And Incentives

Program/incentive	Schedule
Regional extension center grants	Three rounds of two-year grants in 2010, renewable for another two years Grantees are expected to move to self-sufficiency, with markedly reduced dependence on federal funds in later years
Workforce programs	2010 grants to five regional consortia of community colleges for two years (possible renewal for an additional year) 2010 grants to five curriculum development centers for two years to develop curricula in twenty content areas 2010 grant to develop and administer 10,000 no-cost competency exams to individuals in nondegree programs Nine university-based program grants to support training in key functionalities, with funding allocated per trainee
State health information exchange program created	Fifty-six cooperative agreements with state governments or nonprofit organizations designated by the governor Agreements span four years, but state matching requirements increase from 2010 to 2013
Meaningful-use incentives	Stage 1 regulations promulgated July 13, 2010, to provide incentive payments for 2011 and 2012 (now extended to 2013) Incentive payments authorized through 2016 (Medicare) and 2021 (Medicaid), with the expectation that requirements will become more demanding over time In 2015 Medicare-eligible providers who are not meaningful users will be penalized
Beacon grants	Three-year cooperative agreements with seventeen organizations, effective mid-to-late 2010
SHARP grants	Four-year cooperative agreements in each of four research areas: Security of health information technology Patient-centered cognitive support Health care application and network platform architectures Secondary use of electronic health record data

SOURCE Authors' summary based on documents posted on the Office of the National Coordinator for Health Information Technology website (Note 47 in text). **NOTE** SHARP is Strategic Health IT Advanced Research Projects.

A third concern is the evolution of technology and lack of consensus on how to facilitate robust exchange. Short-term solutions to facilitate initial exchange are necessary, but the long-term success of HITECH will depend on developing a vision for future exchange that will work in diverse settings and on implementing a strategy to achieve that vision.

REALISTIC ASSUMPTIONS AND GOALS FOR PROGRESS HITECH's scope of activities and implementation schedule are ambitious, and they depend on realizing the expectation that activity will begin immediately across a variety of interrelated areas whose success depends on one another (Exhibit 4). This reality means that infrastructure and programs to support that infrastructure and its desired outcomes must be developed simultaneously.

Federal funding is also front-loaded (that is, available in the early years), and most federal support ends entirely after four years. In many ways, it is this scope and schedule that poses the greatest challenges for HITECH's ultimate success. Experience with major transformations across industries shows that they can take many years to occur, regardless of legislation.[16] However, Congress is elected on shorter cycles, and HITECH's linkage to economic stimulus goals means that expectations are high for rapid progress.

REALISTIC MEASURES OF SUCCESS Given HITECH's implementation environment and aggressive timeline, its success is likely to be measured less by ultimate outcomes (improved quality and efficiency) than by the evidence it provides to policy makers and stakeholders that progress is being made and warrants continued investment. Given HITECH's goals, this probably means evidence that providers are adopting electronic health records at a reasonable pace; data are flowing more easily among diverse providers, vendors, patients, and geographic locales; and meaningful use is starting to yield positive effects on health and other valued outcomes, at least in areas with robust systems.

Early indications that HITECH is creating improved channels of exchange and making meaningful use of health information technology, together with evidence from advanced communities that such practices can make a difference and generate tangible results that will be relevant elsewhere, ultimately may be critical to maintaining interest in and commitment to supporting the work needed to make HITECH advances real. ■

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In this month's *Health Affairs*, Marsha Gold and colleagues examine the market and regulatory forces that will influence the success of the 2009 Health Information Technology for Economic and Clinical Health (HITECH) provisions of the American Recovery and Reinvestment Act in steering the nation toward the adoption and meaningful use of health information technology.

Among many factors that will be important, they conclude that providers, patients, and the public at large must be persuaded of the value of health information exchange and support its implementation, and that evidence that care is improving will be critical in making the case for continued stakeholder support after much of HITECH's financial support ends.

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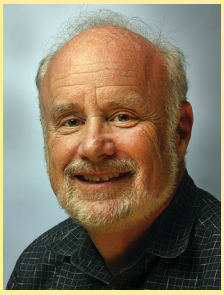

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