eHEALTH INITIATIVE

Real Solutions. Better Health.

Staying Alive: Determinants of HIE Sustainability

A Special eHealth Initiative Report

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About the eHealth Initiative

Since 2001, the eHealth Initiative (eHI) has represented the multiple and diverse stakeholders who are improving healthcare through the use of Health Information Technology (HIT). The eHealth Initiative's mission is to drive improvement in the quality, safety, and efficiency of healthcare through information and technology. eHI is the only national organization that represents all of the stakeholders in the healthcare industry.

eHI counts over 200 organizations amongst its members, including: clinicians, consumer and patient groups, employers and healthcare purchasers, health plans, health information technology (HIT) suppliers, hospitals and other providers, laboratories, pharmaceutical and medical device manufacturers, pharmacies, public health agencies, quality improvement organizations, standards groups, and state, regional and community-based organizations.

In 2005, eHI launched Connecting Communities, a rapidly growing coalition of leaders representing more than 250 state, regional and community-based initiatives focused on improving healthcare through health information exchange.

Working with its membership, eHI advocates for the use of health IT that is practical, sustainable and addresses stakeholder needs, particularly those of patients.

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I INTRODUCTION

The U.S. health system is fragmented. According to the New England Journal of Medicine, the average Medicare patient sees seven different providers annually[1]. The average patient with chronic conditions may see up to 16 providers annually, and 33 percent of all patients will change primary care providers annually. Given the splintered nature of the health care system, the secure transfer of patients' health information becomes not only financially valuable, but necessary for the safety and quality of patients' care.

As the need for health information exchange (HIE) to transform the healthcare system has become more evident, health information exchange initiatives (HIEs) have been growing in number and maturity. Since the eHealth Initiative (eHI) started the HIE survey in 2004, the number of HIEs has grown tremendously. In 2010, eHI confirmed 234 active initiatives, including the 56 grantees of the Office of the National Coordinator (ONC) State HIE Cooperative Agreement Program. The number of operational initiatives has increased from nine in 2004 to 73 in 2010, and there are now operational HIEs in almost every state.

The passage of the Health Information Technology for Economic and Clinical Health Act (HITECH) in 2009, helped propel HIE forward. The HITECH Act provided much needed funding to states to jumpstart statewide HIEs. Through HITECH, the State HIE Cooperative Agreement Program awarded funds to 56 states and territories. The funds helped create State Designated Entities (SDEs), responsible for facilitating the exchange of information within their respective states. Five of the SDEs reported that they are now operational.

While many HIEs exist and are operational, only a small number of these organizations are sustainable. Being an operational organization, means that the HIE is developed enough technically to exchange data among providers, hospitals, and other health care organizations. Sustainability moves beyond simply being able to exchange data among systems. Sustainable HIEs are not dependent on state or federal grant funding. In some cases, states are paying users of an HIE, not in a granting environment, and are therefore part of an HIE's sustainability model. Rather, they support their organization by developing a business model that generates enough revenue to cover their ongoing operational and capital costs. HIEs that cannot support their long-term operations through various revenue streams risk failure. Failure can result in financial loss and also diminish trust amongst stakeholders. To move forward to a holistic health care system, HIEs must build sustainable business models that support their financial needs now and in the future.

II WHY IS THIS REPORT IMPORTANT?

While there are many theories about sustainability, there has yet to be empirical evidence about the drivers of HIE sustainability. This report is one of the first to address the determinants of HIE sustainability, based on empirical data. eHI engaged the University of Maryland, Center for Health Information and Decisions Systems, to undertake an empirical analysis of the drivers of sustainability, based on the annual HIE surveys from 2008-2010. The analysis examined four measures of sustainability. A number of factors were identified related to sustainability, including:

- **The sustainable HIEs employed fee models.** The analysis revealed that the subscription fee model was related to all of the measures of sustainability and maturity. The transaction fee model related to all of the measures, except maturity.
- **Offering services which support meaningful use were related to sustainability.** Implementing and increasing the number of services that support eligible providers and hospitals in qualifying for Meaningful Use were linked to sustainability and maturity.
- **Administrative service offerings were not related to sustainability factors.** Administrative services such as claims processing and referral processing had no effect on sustainability factors or HIE maturity level.
- **Most sustainable HIEs provided value-add services.** Provision of an EHR and quality reporting influenced sustainability and maturity of an HIE.

This report explores the findings outlined above, the challenges of sustainability, a current view of the HIE landscape, and implications of HIE sustainability.

III WHY IS SUSTAINABILITY DIFFICULT?

Since 2004, the eHealth Initiative has been tracking the progress of initiatives across the country. For the last seven years, initiatives have stated that "achieving a sustainable business model" is the most difficult challenge they are facing. This is not surprising considering some studies estimate that one in four HIEs has yet to reach sustainability[2]. There are a number of reasons why building a sustainable business model is difficult.

A Public Good

First, HIE is a public good, meaning no one can be excluded from using it, and the use of HIE by one does not diminish its availability to others. Unlike other public goods, those that benefit most from HIE, are not necessarily responsible for funding. For example, patients will benefit both financially and physically from HIE, but they are rarely asked to cover the cost of implementing and maintaining HIE infrastructure. Providers, on the other hand, may not benefit financially from HIE, but in most cases carry a large portion of the cost. The nature of HIEs leads to a free rider problem: the individuals that benefit most from HIE do not contribute to financially supporting it. Additionally, providers and hospitals bear the largest costs, while seeing the least benefit.

Value and Participation

A second difficulty in building a sustainable HIE business model is demonstrating value and return on investment (ROI) to stakeholders, so that they will participate. HIEs need a high participation rate from patients, providers, hospitals, and payers in order to generate enough revenue to support their organization. To get stakeholder buy-in, they must demonstrate value and ROI to the stakeholders. However, quantifying the financial benefits of HIE is difficult, since it is such a nascent field. The non-financial benefits can easily be demonstrated, but to engage paying stakeholders, financial value must be shown. A standard formula for showing ROI to stakeholders does not exist, most likely because stakeholder needs change, based on geographic location. Additionally, most formulas that are created are based on conjecture, rather than factual information gathered from hard data. Consequently, HIEs struggle to demonstrate value and ROI to stakeholders, which can decrease participation and threaten sustainability.

Offering Valuable Services

A final difficulty is determining the right mix of services for a sustainable business model. HIEs must offer services that providers, hospitals, and payers are willing to purchase. These services will vary based on geography, size of the organization, existing infrastructure, and budget. HIEs will have to determine the services to offer and their specific market needs, and they will need the technical ability to provide them. As competition between HIEs increases, they will need to continually improve their service offerings, in order to remain viable. Additionally, the innovative services of today will most likely be the common services of tomorrow. As a result, HIEs will need to continually innovate their service offerings, and change their business model based on new services.

IV | POTENTIAL REVENUE MODELS

While there is no magic bullet for sustainability, there are a number of options that HIEs can and are pursuing including, but not limited to: fees for data providers and users; levies or utility model; and, charging for value-add services.

Fees for Data Providers and Users

Subscription fees can be charged to the data providers and users of an HIE. The subscription fees are a set amount that can be monthly, annual, or by type of service. The fees will typically vary by the size of an organization or be a tiered structure based on the number of services used. Subscription fees allow data providers and users to purchase a set level of access. Transaction, or "by the drink" fee structures, charge data providers and users for each transaction which occurs in the exchange. Transaction fee arrangements can include fees for: clinical results delivered, covered lives, and licenses to use a particular software package over the internet.

Levies to Support Infrastructure or Utility Model

Some state governments may attempt to support their HIE infrastructure the same way that other public utilities are supported—through a levy. State governments could levy taxes on all state residents, similar to taxes applied for water or electric utilities. Alternatively specific stakeholders or users of the services could be charged. Other methods of taxation could be used with payers or providers, including: revenue based, per member/per month, transaction fees, or part of a provider's or hospital's state licensure fee. These levies could support one or more HIEs operating in the state.

Charging for Value-Add Services

Value-add services have the potential to lower costs for payers and providers. For payers, these services can lower licensing, maintenance, and operational fees; they can also support reporting requirements. Value-add services for payers include: claims processing, eligibility verification, prior-authorization, NCQA/HEDIS reporting, patient education, and wellness programs/care coordination. Providers can also benefit from value-add services, including quality reporting and continuity of care services.

V | STAGES OF DEVELOPMENT

Most initiatives focused on health information exchange will move through predictable stages of development, but at a varying pace. In 2005, eHealth Initiative developed a framework for assessing and tracking health information exchange development. Based on working with hundreds of leaders involved in the development and implementation of health information exchange-related activities, eHealth Initiative identified seven stages of development (see Figure below). These stages help set a consistent standard by which initiatives can assess themselves, allowing for continuity when analyzing results from year-to-year.

Stage 1	Recognition of the need for health information exchange among multiple stakeholders in your state, region or community. (Public declaration by a coalition or political leader)	
Stage 2	Getting organized; defining shared vision, goals, and objectives; identifying funding sources, setting up legal and governance structures. (Multiple, inclusive meetings to address needs and frameworks)	
Stage 3	Transferring vision, goals and objectives to tactics and business plan; defining your needs and requirements; securing funding. (Funded organizational efforts under sponsorship)	
Stage 4	Well under way with implementation– technical, financial and legal. (Pilot project or implementation with multiyear budget identified and tagged for a specific need)	
Stage 5	Fully operational health information organization; transmitting data that is being used by healthcare stakeholders.	MATURE HIEs
Stage 6	Fully operational health information organization; transmitting data that is being used by healthcare stakeholders and have a sustainable business model.	
Stage 7	Demonstration of expansion of organization to encompass a broader coalition of stakeholders than present in the initial operational model.	

VI | IDENTIFYING SUSTAINABLE INITIATIVES

Most HIEs are working towards sustainability and building and refining their sustainability plans. However, sustainability is an elusive concept. With this in mind, eHI in partnership with the University of Maryland, decided to explore sustainability.

As a starting point, the following four factors were presumed to demonstrate sustainability:

- Paying customers
- The number of different stakeholders that pay fees to participate in the HIE
- Breaking even through operational revenue alone
- The level of operational maturity

The study hypothesized that five variables impact the four factors above. The variables studied included: subscription and transaction fee models, providing services that link to meaningful use, providing administrative services (claims, eligibility, and others), providing value-add services (quality reporting, electronic health record, and others), and an opt-in versus an opt-out policy. Statistical analysis was conducted to test these hypotheses.

A Note to Our Readers

As a result of the 2010 Annual HIE Survey, eHI identified 18 sustainable HIE initiatives. For the purposes of the 2010 analysis, sustainable initiatives were defined as groups that were operational (Stage 5, 6, or 7), not dependent on federal funding in the last fiscal year, and financially broke even through operational revenue alone. The 18 initiatives are a small number when taken in context of the 234 initiatives eHI identified in 2010. An in depth look at the 18 sustainable initiatives is provided in the appendix.

VII VARIABLES EXAMINED

Based on common thinking in the HIE field, eHI chose a number of variables to analyze, in order to determine if any link existed with sustainability. The variables examined included: subscription and transaction fee models, providing services that support meaingful use, providing value-add services, providing administrative services, and an opt-out versus an opt-in policy. These variables are discussed below.

Fee Models

Many HIEs are using subscription or transaction fee models, or a combination of both to support long-term sustainability (examples include HealthBridge, Community Health Information Collaborative, and Utah Health Information Network). HIEs using a combination of both fee models, typically use the subscription model to charge for core clinical services and the transaction model to charge for value-add services.

Subscription fees are a set amount that can be monthly, annual, or by type of service. The fees will typically vary by the size of an organization or be a tiered structure based on the number of services used. Subscription fees allow data providers and users to purchase a set level of access. Of the many HIEs charging physicians an annual or monthly subscription fee, the average cost per physician, according to the 2010 HIE survey, is between $251 and $1,000 annually. Transaction fee structures charge data providers and users for each transaction that occurs in the exchange. Transaction fee arrangements may include fees for sending and/or receiving secure messages, lab results, claims, eligibility transactions, and others.

The subscription and transaction fee models both have challenges that may make them difficult to utilize. The models may not generate enough revenue alone and may require more value-add services, which can be difficult to provide for HIEs that are still in the early stages of development. Additionally, both models must have enough participants to generate sufficient revenue to cover operating costs. Depending on price-points set by the HIE, ensuring the right level of participation may be difficult. Finally, HIEs using the transaction model will most likely have higher administrative costs in order to manage the fee structure and ensure transaction quality and accuracy[3].

Fee Model Findings: Analysis of the subscription fee model found that the subscription model is related to all of the measures of sustainability and maturity. Those measures are: 1) paying customers, 2) the number of different stakeholders that pay fees to participate in the HIE, 3) breaking even through operational revenue only, and 4) the level of operational maturity. The analysis of the transaction fee model found that it is related to all of the measures of sustainability and maturity, with an important caveat. The model is not related to the number of different stakeholders that pay

fees to participate in the HIE. It seems then, that both models can lead to long-term sustainability of an HIE; however, the transaction model may be slightly less beneficial based on the lack of stakeholder diversity.

Meaningful Use Services

The HITECH Act created the CMS Medicare and Medicaid Electronic Health Records (EHR) Incentive Programs for eligible providers and hospitals. The programs provide a financial incentive for the "meaningful use" of certified EHR technology to achieve health and efficiency goals. There are incentives for eligible professionals and hospitals that enroll in the program, by 2014 under the Medicare program, and by 2016 under the Medicaid program. The final rule for Stage One of the Meaningful Use guidelines was released July 13, 2010. Stage One laid out core and menu objectives that eligible providers and hospitals must meet in order to qualify for the incentive program. HIEs have been and continue to offer services that can support eligible providers and hospitals in qualifying for Meaningful Use.

Meaningful Use Findings: The analysis examined whether these services were offered by organizations that exhibit measures of sustainability. Findings indicate that implementing and increasing the number of services that support eligible providers and hospitals in qualifying for Meaningful Use is linked to HIE sustainability and maturity.

Value-Add Services

Some HIEs have started offering value-add services that solve business problems for providers, hospitals, and payers. Many HIEs, including state-run HIEs, are basing their sustainability plans on providing value-add services. These value-add services include: quality reporting (providers and payers), care coordination, EHR-Lite options, patient education, and treatment cost calculators.

Providing value-add services allows HIEs to differentiate themselves from their competition, which in turn has the potential to contribute to long-term sustainability.

Less mature HIEs are not able to provide value-add services immediately. As an HIE develops, and expands its technical capabilities, it can start to offer these value-add services, but they take time to develop.

Value-add Services Findings: Two value-add services, provision of an EHR and quality reporting, were examined. Analysis found that provision of these value-add services influences the measures of sustainability and maturity of an HIE. Measures of sustainability are: paying customers, the number of different stakeholders that pay fees to participate in the HIE, and breaking even through operational revenue alone.

Administrative Services

Many HIEs, especially those run by states, offer administrative type services to providers, hospitals, and payers. Administrative services can include claims processing, eligibility verification, prior-authorization processing, and referral processing. Utilizing an HIE for administrative services can be a cost saving measure for providers, hospitals, and payers. State-run HIEs have an additional impetus to offer these services, since they are required to coordinate with the state Medicaid agency. State-run HIEs may have a greater ability to connect with the Medicaid Management Information System (MMIS), giving them the opportunity to provide administrative services with the information they receive from the MMIS.

Since most HIEs were not originally started to perform these administrative services, it is unclear whether these services will truly support sustainability. HIEs have competition in providing administrative services, since there are already numerous entities that have been providing these administrative services for years (i.e. clearinghouses). It should be noted that HIEs participating in the State HIE Cooperative Agreement Program are required to provide eligibility verification and claims processing under the Original Funding Announcement. There are also potential privacy issues when clinical data and administrative data are in the same HIE, with payers potentially having access to the clinical data.

Administrative Services Findings: Two administrative services were examined for their relation to sustainability: claims processing and referral processing. Analysis found that providing these two administrative services had no effect on the sustainability factors or HIE maturity level. While these services were not statistically found to relate to the sustainability measures, it is unclear why these services are not linked to sustainability.

A Note About Consent Models

HIE initiatives, where empowered to do so, adopt varying approaches to patient consent to participate in HIE. "Opt-in consent" usually requires affirmative authorization from the patient, often through signing a standardized consent form, before a patient's health information may be exchanged through the network. "Opt-out consent" may include, but does not require, that an organization gives notice, via a mailing, brochures or posted notice, at which point the patient can object to having their health information exchanged through the network. Hybrid models of consent are available as well. In these models, patients may opt-out of health information flowing to the health information organization (HIO), but opt-in and thereby consent to take health information out of the HIO. Analysis was performed on the opt-out and opt-in consent models to determine if a link existed with sustainability.

Opt-in/Opt-out Findings: Analysis found that the opt-out form of consent is more likely to influence increased HIE maturity than the opt-in form. While this was not strongly supported in every year of the analysis, it was supported in the 2010 data. There was no clear relationship with sustainability over time.

Methods

This research brief is based on survey results from the eHealth Initiative HIE Surveys 2008 through 2010. Each year, eHI surveys a myriad of organizations that self-identify as health information exchanges. Respondents are from national, state, regional, and community-based initiatives. The survey is fielded during May and June of each year. Response rates from each year are: 2008 N= 130, RR not available; 2009 N= 150, RR = 78%, and 2010 N= 199, RR= 85%.

VIII CONSIDERATIONS FOR MOVING FORWARD

HIEs have come a long way since the first eHI survey in 2004. However, the one challenge that persists is sustainability. The findings present some important points for groups to consider as they move forward.

Sustainable models do exist. It is worth noting that many sustainable HIEs existed prior to HITECH funding. Given the large federal investment in exchange, there is significant interest in seeing this investment prove fruitful. Understanding the attributes of sustainable models will be critical to the success of recently funded state designated entities and other HIEs.

Fee models affect sustainability and participation. Utilizing the subscription and transaction fee models can help HIEs support themselves. It is interesting that the transaction fee model has no link to the number of different paying stakeholders in an HIE. Transaction fees can be a very expensive fee model for data providers and users. While they can generate a large amount of revenue for the HIE, the cost may be prohibitive, especially for smaller, nascent organizations. The lack of a multitude of paying stakeholders could be due to these prohibitive costs. While hospitals may be able to afford the transaction fees, small providers may not. It is unclear from the analysis whether the transaction fee model decreases participation in the HIE, but it is something HIEs need to consider when building their sustainability models. HIEs must also consider how they will show providers and hospitals that the fees they are paying can be offset through the savings generated by using an HIE's services. Many HIEs have created return on investment calculations that demonstrate to providers and hospitals the savings they can achieve. These savings can then offset the cost of participating in an HIE.

Federal Policy is Helping, Not Hindering Sustainability Efforts. It is also clear from the findings, that the Medicaid and Medicare EHR Incentive program and the meaningful use requirements may help HIEs with sustainability. The majority of the 18 sustainable initiatives are providing services that help providers and hospitals meet the meaningful use requirements. Additionally, the analysis found that providing services to support meaningful use is linked to sustainability. The incentive program will seemingly help HIEs to be sustainable, by offering HIEs guidance on service provision.

Not all services support sustainability. It is also important to note that providing administrative services may not support sustainability. HIEs have no requirement to offer administrative services, except those participating in the State HIE Cooperative Agreement Program. Based on the findings, HIEs should consider if offering administrative services are worth the cost of the necessary infrastructure. Many payers offer ways for providers and hospitals to submit claims and eligibility verifications electronically, so offering these services through the HIE may not be financially beneficial to the HIE.

It is not clear if consent models affect sustainability. The opt-out consent model seems to have no relation to sustainability, but it is unclear from the analysis the true relationship. The opt-out model has the potential to have more patient data, since patients do not have to actively put their information in the HIE. More data in the HIE may lead to more providers and hospitals participating, which would lead to more revenue and sustainability. HIEs must ensure they have a critical mass of data readily available, or they risk losing participation by hospitals and providers. However, the analysis is not definitive on the relationship between consent models and sustainability.

New revenue models need to be evaluated. Going forward it is appropriate to evaluate some of the new revenue streams HIEs are considering, including: a shared revenue model and levies on providers, hospitals, and payers[4]. There is little data on the use and effectiveness of these models. The 2011 HIE survey anticipates additional growth in the maturity and sustainability of HIEs, and the opportunity to evaluate some of the innovative ways HIEs are finding to achieve sustainability.

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[1] "Coordinating care – a perilous journey through the health care system," T. Bodenheimer. NEJM, 2008: 358(10):1064-1071.

[2] "US Regional Health Information Organizations: Progress and Challenges," J. Adler-Milstein, D.W. Bates, A.K. Jha. Health Affairs, 2009: 28(2): 483-492.

[3] "Determining the Path to HIE Sustainability," J. Covich, G. Morris, M. Bates. Ann Arbor, MI: February 2011.

[4] Ibid.

IX IN DEPTH LOOK AT EHI SUSTAINABLE INITIATIVES

In the 2010 Annual HIE Survey, eHI identified 18 sustainable initiatives. For the purposes of the 2010 analysis, sustainable initiatives were defined as 1) groups that were operational (Stage 5, 6, or 7); 2) were not dependent on federal funding in the last fiscal year; and 3) financially broke even through operational revenue alone. The 18 sustainable HIE initiatives are a small number when taken in context of the 234 total HIE initiatives that eHI identified in 2010. This appendix takes an in-depth look at these 18 sustainable HIE initiatives.

There are five variables that eHI and the University of Maryland analyzed for a relationship with sustainability:

- Fee models (subscription or transaction)
- Meaningful use services
- Value-add services
- Administrative services
- Consent models

Each variable is discussed in more detail on the following pages.

Stakeholders

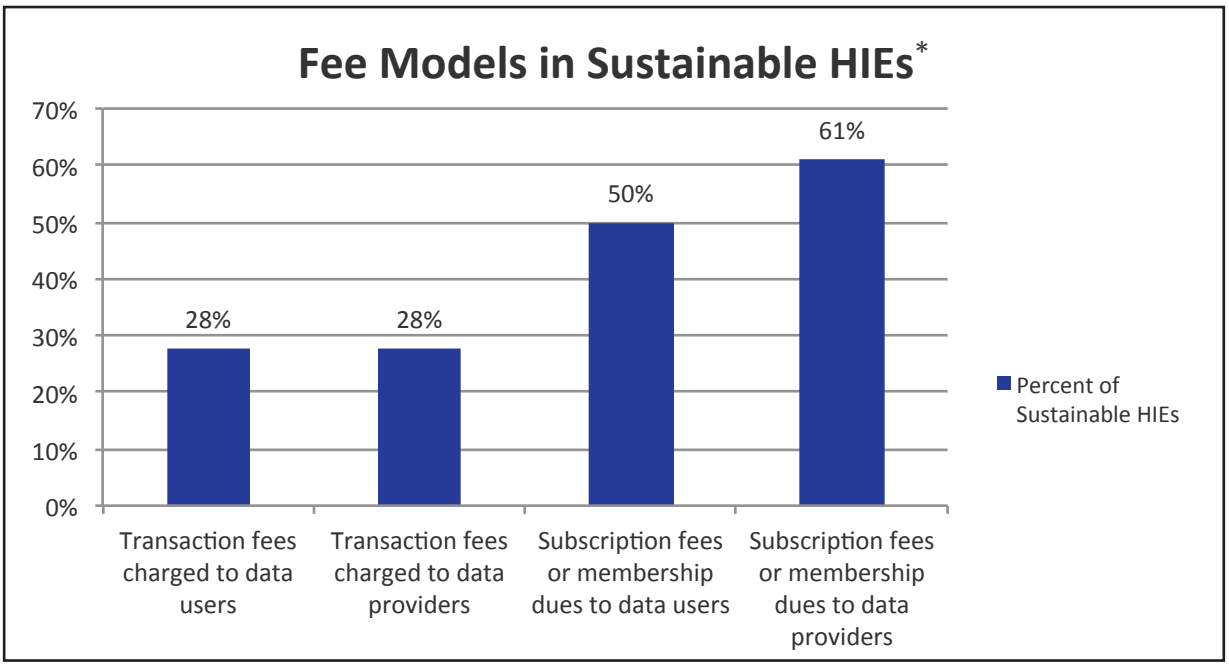
The 18 sustainable HIE initiatives have multiple stakeholders that pay a fee to participate in the initiative. While hospitals are the main source of income, many sustainable initiatives receive fees from health plans. Primary care physicians are an additional, albeit smaller, source of revenue. In fact, 11 of the 18 initiatives do not require physicians to pay a fee to access the health information exchange.

Stakeholders Paying Participation Dues or Fees in Sustainable Exchanges*	
2010	
Hospitals	11
Health plans	8
Community and/or public health clinics	7
Independent laboratories	6
Independent radiology centers	6
Primary care physicians	6
Behavioral or mental health providers	5
Long-Term Care providers	5
Outpatient/Ambulatory surgery centers	5
Specialty care physicians	5

* Taken from the 2010 Annual HIE Survey

Fee Models

The 18 sustainable HIE initiatives utilize the same revenue sources as non-sustainable initiatives, mainly fee models. These initiatives use a subscription fee model or a transaction fee model. Four of the sustainable initiatives indicated that they use a combination of both fee models.



* Taken from the 2010 Annual HIE Survey

Meaningful Use Services

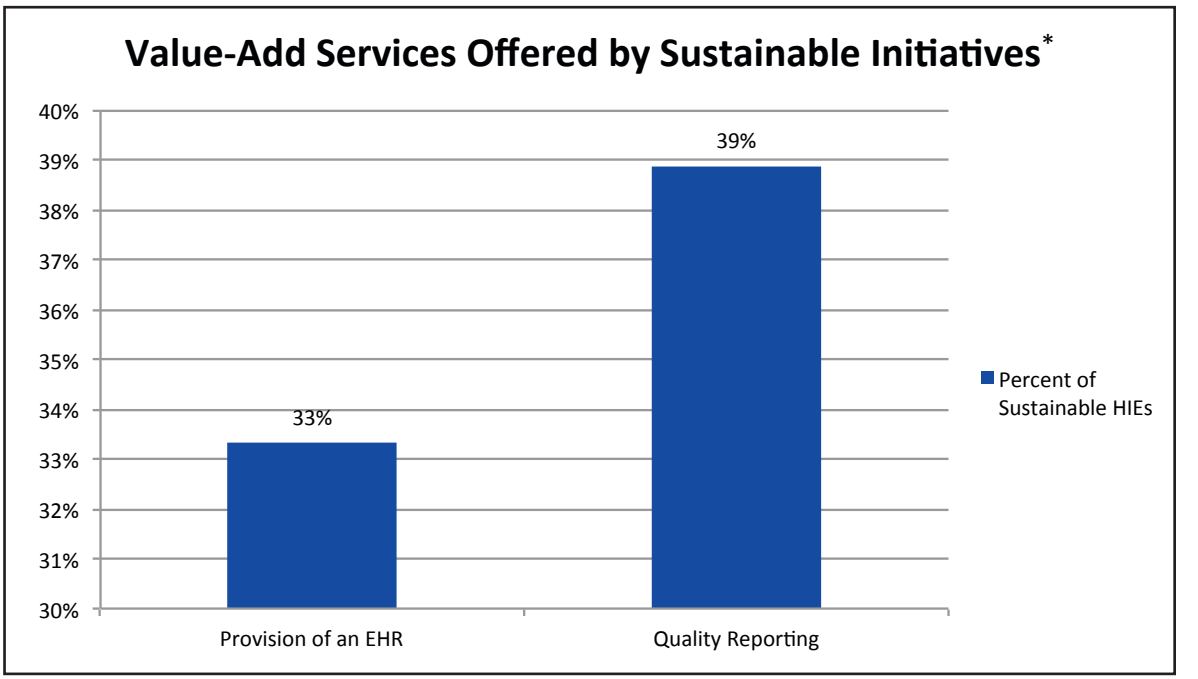
The 18 sustainable HIE initiatives offer many services that support Meaningful Use. The chart below details some of the meaningful use services offered. Some services are more widely available than other services.

Percent of the Sustainable Initiatives Who Are Currently Providing or Will Provide Meaningful Use Services*	
Core Items (n=18)	
Connectivity to electronic health records	94%
Health summaries for continuity of care	94%
Electronic prescribing	78%
Alerts to providers Drug-to-Drug	78%
Alerts to providers Drug-to-Allergy	78%
Clinical decision support	78%
Medication data (including outpatient prescriptions)	83%
Emergency Department episodes/discharge summaries	94%
Care summaries	89%
Menu Items (n=18)	
Results delivery (e.g. laboratory or diagnostic study results)	94%
Disease or chronic care management	89%
Quality improvement reporting for clinicians	89%
Reminders	50%
Immunization Registry	72%
Medication reconciliation	67%
Patient-provider clinical data exchange	78%
Public health: electronic laboratory reporting	78%
Public health: syndromic surveillance reporting	78%
Laboratory results	94%
Inpatient discharge summaries	89%
Advance directives	50%

* Taken from the 2010 Annual HIE Survey

Value-Add Services

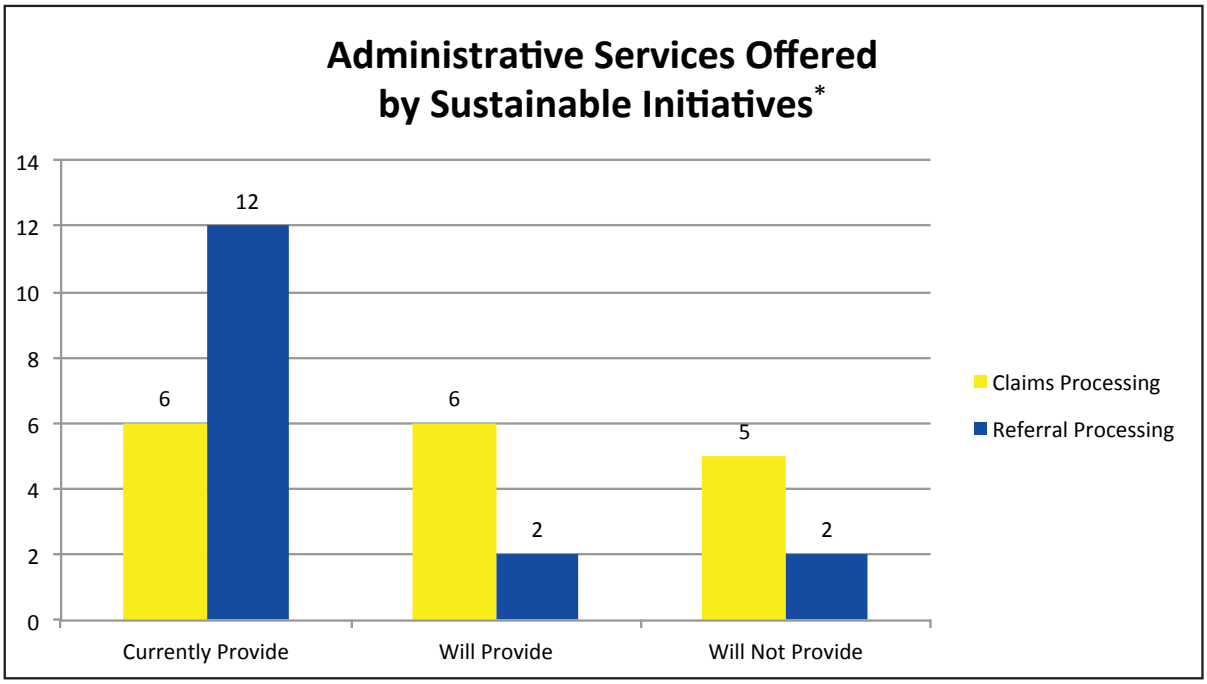
Continual innovation in service offerings is an important part of any HIEs long-term sustainability plan. The 18 sustainable HIE initiatives are offering the value-add services evaluated by eHI and the University of Maryland: provision of an EHR and quality reporting.



* Taken from the 2010 Annual HIE Survey

Administrative Services

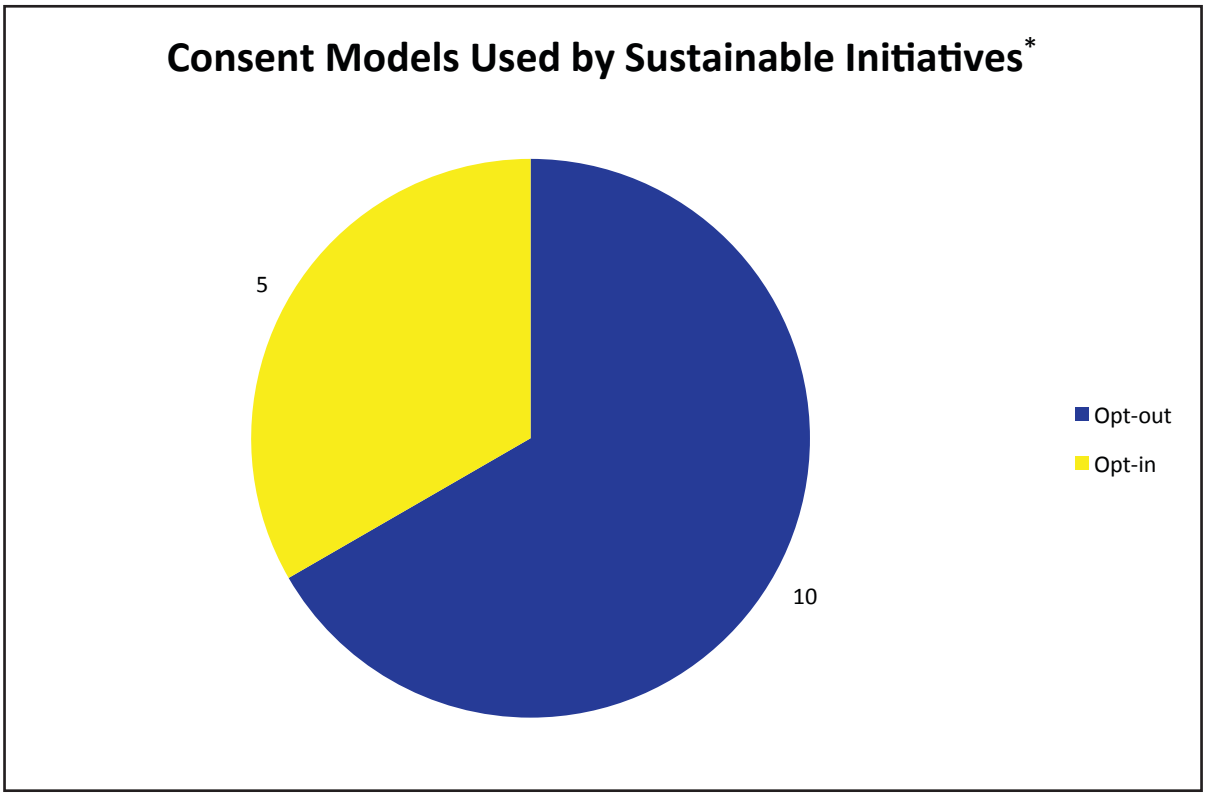
A number of the 18 sustainable HIE initiatives are currently offering, or plan to offer administrative services. These administrative services include claims and referral processing. Surprisingly, some sustainable HIEs will not be providing claims processing at any point. Yet, almost all of the 18 sustainable HIEs are performing referral processing.



* Taken from the 2010 Annual HIE Survey

Opt-In/Opt-Out

HIE initiatives, where empowered to do so, adopt varying approaches to patient consent to participate in HIE. "Opt-in consent" usually requires affirmative authorization from the patient, often through signing a standardized consent form, before a patient's health information may be exchanged through the network. "Opt-out consent" may include, but does not require, that an organization gives notice, via a mailing, brochures or posted notice, at which point the patient can object to having the patient's health information exchanged through the network. Hybrid models of consent are available as well. In these models, patients may opt-out of health information flowing to the health information organization (HIO), but opt-in and thereby consent to take health information out of the HIO. The 18 sustainable HIE initiatives predominantly utilize an opt-out method for consent.



* Taken from the 2010 Annual HIE Survey1

* Taken from the 2010 Annual HIE Survey

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