Oregon's Strategic Plan
For Health Information Technology

Health Information Technology Oversight Council (HITOC)

Staffed by
Oregon Office of Health Information Technology (OHIT),
Oregon Health Authority (OHA)

Introduction and Background

Oregon has a long history of innovation in health care delivery. These initiatives include Oregon's groundbreaking approach to serving Medicaid beneficiaries in the 1980s, a 2009 health reform law that anticipated changes at the federal level, and its latest health system transformation initiative that is accelerating the move to coordinated care via the Medicaid system. The infrastructure that will make many of these reforms possible is health information technology (health IT or HIT) – this includes not only electronic health records (EHRs), but also the secure electronic exchange of patient information, telehealth services to extend medical care across long distances, the analysis and use of health data to support improvements in care, and more.[1]

As part of Oregon's 2009 state health reform law, Oregon's legislature created the Health Information Technology Oversight Council (HITOC) to coordinate Oregon's public and private statewide efforts in health IT. HITOC members, who are appointed by the Governor and confirmed by the Senate, bring a wide range of experience in health and health IT and represent the geographic diversity of Oregon. Among HITOC's goals are encouraging the adoption of electronic health records, developing a strategic plan for a statewide system for electronic health information exchange (HIE), setting technology standards, ensuring privacy and security controls and developing a sustainable business plan to support meaningful use of HIT to lower costs and improve quality of care. HITOC was also tasked with considering options to encourage provider adoption of EHR and to support the Medicaid Transformation Grant. In addition, HITOC provides oversight of the Medicaid EHR Incentive Program, which provides federal stimulus funds for eligible professionals and hospitals to adopt and meaningfully use certified EHR systems; as of July 2012, Oregon providers and hospitals had received over $43 million in Medicaid EHR incentive payments.

Because of both the critical role HIE can play in advancing health reform efforts and the private, state and federal dollars available for HIE planning efforts, HITOC's initial focus was on the development of Oregon's statewide strategic and operational HIE plans. At the same time, it has also provided oversight of efforts to expand use of electronic prescribing, exchange of care summaries and laboratory results and the development of a patient consent policy for HIE. HITOC has sought stakeholder and public input and involved a wide array of stakeholders in workgroups and panels to work through specific issues.

Through regular presentations at HITOC meetings, members and attendees also remain informed about the activities of partner organizations such as OCHIN/O-HITEC (Oregon's regional extension center), the Oregon Health Network (pursuing broadband access for rural areas), health IT workforce development programs at local universities and community colleges, the Oregon Health Care Quality Corporation (a nonprofit organization promoting measurement and improvement of health care quality) and other stakeholders, as well as work being done within the Oregon Health Authority.

Federal strategic planning

[1] For the reader's convenience, a glossary of commonly used health IT terms is included as Appendix A.

Nationally, health IT initiatives have enjoyed bipartisan support, as recently exemplified by a task force on HIT led by Senators Daschle and Frist.[2] Oregon works closely with federal partners, particularly the Office of the National Coordinator for Health IT (ONC) and the Centers for Medicare and Medicaid Services (CMS), on health IT issues. One of ONC's major projects is the State HIE Cooperative Agreement Program, which provides funding for state-level information exchange; Oregon received a grant under this program in 2010. CMS administers the Medicare EHR Incentive Program and oversees state-administered Medicaid EHR Incentive Programs. The expansion of EHR adoption and use of health IT to improve the health care system is clearly a priority for the federal government.

The Federal Health IT Strategic Plan: 2011-2015 was developed under the leadership of ONC and in close collaboration with other federal partners. The federal plan reflects a strategy for coordinating with the public and private sector to realize the federal health IT agenda: improving the quality, efficiency, safety and patient-centeredness of health care. That plan set five general goals:

Goal I: Achieve adoption and information exchange through meaningful use of health IT
Goal II: Improve care, improve population health, and reduce health care costs through the use of health IT
Goal III: Inspire confidence and trust in health IT
Goal IV: Empower individuals with health IT to improve their health and the health care system
Goal V: Achieve rapid learning and technological advancement

Through its close ties to ONC, CMS and other federal agencies, Oregon has closely monitored the federal approach to health IT and has maintained goals that are consistent with work occurring at the national level. Oregon's Strategic Plan for Health IT is designed to be harmonious with the federal approach, but specific to our state's needs and priorities.

[2] Bipartisan Policy Center Task Force on Delivery System Reform and Health IT, "Transforming Health Care: The Role of Health IT," January 2012, http://www.scribd.com/doc/95192917/Transforming-Health-Care-The-Role-of-Health-IT. Accessed July 25, 2012.

Executive Summary

Vision:
Information where, when, and how it is needed to achieve better health, better care, and lower costs for Oregonians.

Guiding Principles:
All of HITOC's strategies are intended to promote the triple aim of better health, better care and lower costs and to ensure the privacy and security of protected health information. HITOC also intends the strategic use of health IT to support advances in health equity.

Strategies:
Background information for each strategy is provided later in this document. Listed here is a high-level overview of each strategy.

Strategy 1) Establish financial support for critical health IT infrastructure through a Health IT Fund – Priorities for the Fund should include supplementing federal incentives for electronic health records (EHRs) targeting high-priority areas such as long-term care and behavioral health settings; supplementing federal and regional health information exchange (HIE) efforts by sustaining statewide HIE services as grant funds from the Office of the National Coordinator for Health Information Technology (ONC) are depleted; developing public resources to complement private EHR/HIT efforts; expanding/extending technical assistance; supporting broadband connectivity; and/or supporting telehealth infrastructure.

Strategy 2) Advance the value of HIT for consumers – Resources and educational materials, designed to meet the needs of Oregon's diverse communities, should be developed to engage patients in the potential of HIT, so that they can improve their health, interactions with the health care system and health care experience. Providers should be supported in finding opportunities to use HIT to engage with patients and educating patients about those opportunities. As consumers become more aware of the potential, it is expected that increasing consumer demand will become a driver for the adoption of health IT applications and use.

Strategy 3) Focus on interoperability as a key component to drive public and private HIT adoption – For EHRs, HIE and telehealth, Oregon should encourage or, where possible, require stakeholders across the continuum of provider types to adopt only technology that aligns with federal standards and standards required for care coordination. Standards should support extensibility so that systems have the flexibility to accommodate the development of new technologies.

Strategy 4) Embrace an enterprise architecture approach to state HIT systems – To the greatest extent possible, all federal funds for HIT activities—including HIE, Health Insurance Exchange (HIX), eligibility and enrollment systems and Medicaid payment systems—implemented by the State of Oregon should be maximally aligned and leverage each other, to make the most efficient use of resources.

Strategy 5) Encourage HIT in emerging care systems that have alternate payment structures – The non-fee-for-service environment of coordinated care organizations (CCOs), accountable care organizations (ACOs) and other emerging payment models, should be leveraged to encourage the adoption and use of all types of HIT, and Oregon should explore opportunities for HIT/HIE requirements in pilot alternative payment models that could be pursued by the Public Employees Benefit Board (PEBB) and the Oregon Educator Benefit Board (OEBB), as well as in the commercial marketplace.

Strategy 6) Extend technical assistance availability – Oregon should pursue opportunities to increase technical assistance, including possibilities for growth and collaboration between OCHIN/O-HITEC, the emerging Patient-Centered Primary Care Home (PCPCH) Institute, and CCO innovator agents. Technical assistance should support providers' adoption of HIT and be responsive to the varied needs of providers across the state. Depending on provider type, population served and geographic area served, technical assistance should be offered on a sliding scale basis.

Strategy 7) Develop a data strategy for statewide analytics – Analytics can support improvements in health care and health equity. CCO planning and implementation has produced a data strategy for initial CCO efforts, but a longer-term strategy should be developed out of the OHA Office of Health Analytics to reduce the reporting burden on providers and to leverage private analytics efforts, the capabilities of Oregon Health Care Quality Corporation, public health population-based analytics and other existing work. The strategy should be flexible enough to support the needs of communities across the state. To maximize the use of currently available data, programs should be developed for getting data from analytics efforts back to stakeholders and communities in a way that will allow them to improve care, including measurable improvements in health equity. Programs could include a website with centralized resources. These programs should leverage existing private market efforts.

Strategy 8) Coordinate the efforts of all HIT-related initiatives in Oregon – Building on previous coordination among federal HIT grantees, all HIT-related initiatives in Oregon (including telehealth, broadband connectivity, HIX, health system transformation efforts, and health analytics) should regularly convene and share information relevant for collaboration to HITOC with the goal of aligning efforts, sharing resources and leveraging common outreach efforts.

Strategy 9) Use HIT to advance population health -- The primary strategic actions are to develop a prioritized list of specific and actionable opportunities for health IT to advance population health in Oregon and a strategy for incorporating those opportunities in health IT planning.

Overview of strategic planning process

In Oregon, HITOC has a statutory duty to develop a strategic plan for health IT:

> *ORS 413.308 Duties of council. The duties of the Health Information Technology Oversight Council are to: (1) Set specific health information technology goals and develop a strategic health information technology plan for this state.*

HITOC began the process of developing this strategic plan in January 2012, when it began to identify priority subject areas to address in the strategic plan. With input from stakeholders and experts in various fields, these strategic areas have then been examined one by one during HITOC public meetings, and an ideal state for each was developed, along with perceived barriers to reaching that ideal state and potential strategies for overcoming those barriers.

The process began at the January HITOC meeting, where HITOC members worked toward consensus on whether this was the right time to begin developing a strategic plan, what high-level goals it should have, who the plan's audience would be, what stakeholders would be impacted and what the plan's scope and duration should be. At the February meeting, the council began to identify some underlying principles for the strategic plan. HITOC chose to focus the plan with a timeframe of three to five years. The council agreed that the plan should focus on ways for health IT to advance the triple aim of better health, better care and lower costs; align with federal goals; support innovation; advance equity in health care; and serve the needs of all Oregonians.

HITOC spent time at its March to June meetings prioritizing content areas; determining the ideal future state that would be achievable within three to five years; identifying barriers and discussing possible strategies to address priorities. The council used specific criteria to assess barriers and strategies:

Criteria to Assess Barriers:

- Will the barrier exist in 3-5 years if HITOC does not address it?
- Are there measurable goals or milestones for the next 3-5 years?
- Will overcoming the barrier be an effective step in moving Oregon closer to achieving HITOC's vision for Oregon?
- Can the barrier be improved through health information policy and planning guidance?

Criteria to Assess Strategies

- Is this option expected to be an effective solution in overcoming a specific barrier?
- Is this option likely to be feasible and actionable for stakeholders?
- Is this option not in conflict with other strategic plans/initiatives?

HITOC began to develop metrics/milestones for each appropriate content area and recommended strategic options at its July meeting.

Input was invited throughout the development of the plan, and stakeholders and partner organizations provided information and ideas to HITOC. Along with opportunities for public comment at each of the HITOC meetings where the strategic plan was discussed, HITOC also sponsored three public webinars in July and August to solicit stakeholder input on specific strategies and metrics, and had strong attendance. In addition, staff presented information about the plan and opportunities for input during a webinar in May, during which Oregon's federal health IT grantee organizations updated stakeholders about the health IT landscape in Oregon.

HITOC focused its analysis and planning on six key subject areas:

- **Electronic Health Records (EHRs)**
  An EHR is an electronic record of patient health information generated by one or more encounters in any health care delivery setting. A "certified" EHR meets criteria established by the Office of the National Coordinator for Health IT (ONC). Among other capabilities, certified EHRs capture patient demographic and clinical health information, which is needed to measure progress toward health equity, and they support improved care coordination.

  As of July 2012, 1,357 eligible professionals and 14 hospitals in Oregon had received Medicare incentive payments, and 827 eligible professionals and 36 hospitals in Oregon had received Medicaid incentive payments. Another 1,169 providers had registered their intent to qualify for Medicare payments, and 304 providers and 10 hospitals had registered their intent to qualify for Medicaid (and Medicare for dual-eligible hospitals) payments and had not yet been approved for payment under the Medicaid and Medicare EHR Incentive Payment Programs.

  While Oregon is among the leading states in EHR adoption, large gaps in adoption remain, particularly among providers in rural areas, those in small practices, those working in settings such as behavioral health and long-term care, and public health, particularly home visiting case management. The federal EHR incentive programs help providers financially with purchasing certified EHRs, but are not available to all provider types and often provide financial incentives that are ultimately inadequate to offset the costs to providers. Meanwhile, there are technical gaps in usability and interoperability for most EHR systems, so many providers who have EHRs are not using them to their full capabilities. Clinical decision support (CDS) is one such EHR component that could improve quality and efficiency of care; to expand its use, it will be necessary to prioritize CDS development and implementation and disseminate best practices. At the same time, health reform efforts such as CCOs rely on the widespread use of EHRs to ensure coordination of care and support quality improvement initiatives. HITOC wants to support EHR adoption so that:
  - All Oregon health care providers (including physical health, mental health, oral health, long-term care and public health) use certified EHR technology in a meaningful manner at the point of care;
  - All Oregon providers use certified EHR technology to facilitate exchange of health information when, where and how it is needed across all health settings in order to facilitate care coordination;
  - All Oregon providers use certified EHR technology to analyze and submit clinical quality and other measures to improve care.

- **Health Information Exchange (HIE)**
  HIE, the electronic sharing of patients' protected health information beyond the immediate care setting, is taking place in Oregon on a limited basis, mostly between health care organizations that have made large investments in interoperable systems. Several regional health information organizations (RHIOs) exist in Oregon, but their progress has not been as rapid as envisioned in Oregon's strategic plan for HIE, approved by ONC in 2010.

  Meanwhile, Oregon has established CareAccord™ as Oregon's statewide health information exchange and, as the first service offered through CareAccord™, is making Direct Secure Messaging available to all providers at no cost (at least through October 2013, the duration of Oregon's Cooperative Agreement with ONC).[3] Direct Secure Messaging services are an "on-ramp" that will lower the cost of point-to-point HIE in a secure and trusted fashion. If financial support is available, additional services to improve care coordination can be added to the CareAccord™ toolkit. Phase 2 HIE services would likely include items such as a record locator service and notifications to the patient's primary care physician when a patient is seen in an emergency department. In identifying the scope of additional services, priority should be given to services that are identified by stakeholders as necessary to support health system transformation. In an ideally transformed health system:
    - Health information is accessible electronically in hospitals, ambulatory care settings, laboratories, pharmacies, long-term care facilities, health plans, behavioral health and oral health settings and to any emerging provider types in CCOs, as well as by the patients themselves;
    - Statewide HIE services and regional and individual organization HIE efforts are financially sustainable and enable the delivery and coordination of care;
    - Privacy and security are carefully managed and well-understood by all stakeholders;
    - Widespread connectivity supports increased HIE and enables all providers, patients, and family caregivers to access the necessary clinical information when and where it is needed;
    - Patients have the ability to electronically share their information with both caregivers and clinicians in other settings and interface with personal online and mobile applications.

- **Telehealth**
  Telehealth refers to remotely delivered health care, including the exchange of medical information from one site to another via electronic communication to improve a patient's health status. Telehealth devices are generally divided into one of two categories: Networked Medical Devices (devices that are physically connected to networked computers) and Wireless Mobile Devices (devices that are not physically connected, but use cloud computing to send and receive information, such as smart phones and tablets). Currently, telehealth services are offered through several health care organizations in Oregon, but the technology has not been

[3] Oregon's HIE Strategic and Operational Plans are available on HITOC's website: http://www.oregon.gov/oha/OHPR/HITOC/Pages/documents/hitoc_reports.aspx.

widely adopted due to challenges with reimbursement in a fee-for-service setting, credentialing and licensure issues, privacy and security concerns for wireless mobile devices, and the complexities of federal vendor product regulation. In an ideally transformed health system:

- Sustainable business models exist (both in fee-for-service and in value-based payment systems) for technology to address acute and chronic health problems as well as preventive health at a distance;
- Robust connectivity and sufficient bandwidth provide the infrastructure necessary to support telehealth services across the state;
- Licensure and credentialing issues no longer present unnecessary barriers to telehealth adoption and use;
- Privacy and security needs are addressed;
- Adequate product regulations ensure clinical credibility without stifling with innovation.

- **Health Analytics**
  Health analytics is the application of statistical tools and methods to health data to inform decision-making and to improve health care. Currently health analytics is used to assure quality of treatment, to reduce cost, to certify professional staff, for population health and for research. At present, health data is most frequently and reliably captured for billing purposes, known as claims data. Clinical data is primarily captured for treatment purposes and is frequently not in a form that can readily be used for analytics. The technology to merge clinical and claims data is still emerging. In an ideally transformed health system:
  - Existing databases are integrated, and data from different types of care is aggregated to support appropriate access to information by those who need it;
  - All providers are able to capture data in standard formats without impeding provider workflow;
  - Clinical data and claims data are combined to improve individual organizations and the health care system as a whole;
  - Analytics results are communicated to all stakeholders who could use the information to accomplish the triple aim goals of better health, better care and lower costs. Information is communicated from:
    - Federal and state programs back to individual organizations to improve approaches to care;
    - Organizations back to individual providers to improve clinical care and access;
    - Providers to patients to improve health; and
    - Organizations to patients to improve access and equity issues.

- **Health IT Workforce**
  The health IT workforce includes information technology (IT) professionals, health information management professionals and clinical informaticians who perform a variety of roles to ensure that systems are in place and are properly integrated to use health information. The Health Information Technology for Economic and Clinical Health (HITECH) Act of the American Recovery and Reinvestment Act of 2009 (ARRA) includes substantial federal investment in workforce development, and the definition of six essential workforce roles (Clinician Leader, Public Health Leader, Health Information Management and Exchange, Privacy and Security,

Research and Development, and Programmer/Software Engineer). Oregon received funding for several workforce development programs, and those programs met their goals for program enrollment and completion. Nevertheless, some trained workers are having trouble finding employment, and a recent national survey indicates that some employers are having trouble finding applicants who meet their particular needs in terms of experience. Appropriate workforce training will assist provider organizations in adopting and using health IT and will help Oregonians in obtaining well-compensated employment in a growing field. In an ideally transformed health system:

- Oregon will have an adequate pool of health IT professionals in each of the six workforce roles identified by our federal partners;
- Oregon will have adequate professional development programs, including distance education programs for continuing education and certifications, to meet emerging workforce demands with minimal lag between demand for workers and the development of a supply of workers;
- Provider organizations including hospitals and public health organizations will have staff adequately trained in medical informatics.

- **Technical Assistance**

  Technical assistance supports providers in adopting and effectively using health IT. Oregon's regional extension center, OCHIN/O-HITEC, currently offers technical support services at no cost to federally designated priority primary care providers (PPCPs), and offers services to other providers for a fee. Many providers are overloaded with the myriad of technical and system change requirements imposed by state and federal reform efforts, and not all providers who require technical assistance can afford it. OCHIN/O-HITEC's federal funding is limited in scope and duration, and will not last through the period in the near future when it is arguably most needed, as providers must meet "meaningful use" measures to qualify for federal EHR incentive payments. The Patient-Centered Primary Care Home program is developing a technical assistance "institute" for primary care providers. In an ideally transformed health system:

  - Technical assistance would be available as needed for all providers, for all aspects of health IT (e.g., EHR, HIE, telehealth and health analytics);
  - Information on what technical assistance is available would be centrally located on an easy-to-use website;
  - Technical barriers to HIT adoption will be addressed simultaneously to non-technical barriers, including workflow issues and any lack of information about HIT solutions;
  - Professional groups would provide feedback to organizations providing technical assistance to identify priorities for providers to guide the development of additional technical assistance.

Oregon's Strategies for Advancing HIT

Strategy 1) Establish financial support for critical health IT infrastructure through a Health IT Fund.

Background

Major federal legislation, including the HITECH Act in ARRA[4], has supported fundamental components of health IT. Federal funding has enabled Oregon to make great strides in health IT initiatives, but gaps still remain.

Although many Oregon providers and hospitals have qualified for incentives for EHR adoption and use, not all providers are eligible. The HITECH Act provides for incentive payments only to physicians, podiatrists, optometrists, chiropractors, nurse practitioners, dentists and physician assistants. Some oral health providers may face difficulty in meeting the eligibility thresholds for Medicaid or needy patient population. Other provider types—including long-term care providers, dental hygienists, social workers and clinical psychologists—are not covered by the federal incentive programs. To address the gaps for behavioral health providers, OHA's Addictions and Mental Health Division (AMH) is in the process of implementing a certified EHR, the Oregon Web Infrastructure for Treatment Services (OWITS), which is currently available to publicly funded behavioral health providers at no cost. Although some providers have already begun using OWITS and more have expressed interest in doing so, more funding may be required to support the providers with implementation and training.

The HITECH Act also funds Oregon's Regional Extension Center, OCHIN/O-HITEC, to provide no-cost technical assistance to priority primary care providers to adopt and meaningfully use certified EHRs. Federal funds are not available for technical assistance to other provider types who also need to effectively use health IT to coordinate care. State-sponsored technical assistance would be particularly useful in reaching the "white space" providers in rural areas, small practices, long-term care settings or specialties that are not the targets of existing technical assistance grant funding.

HIE also has benefited from federal funding, but more work is required. ONC's State HIE Cooperative Agreement Program approved Oregon's Strategic and Operational Plans for HIE in December 2010, providing $8.58 million for Oregon. With this funding, the State of Oregon has launched CareAccord™ as Oregon's statewide health information exchange, with Direct Secure Messaging as the first service offered.

To fully realize the potential of HIE to support care coordination, additional HIE services are needed across the state, and connectivity challenges in rural areas will need to be addressed. Many organizations are currently focused on mitigating negative financial impacts stemming from the current health care reform environment. These organizations may not yet see HIE as a financially viable investment.

[4] The American Recovery and Reinvestment Act of 2009 (ARRA), Title XIII- The Health Information Technology for Economic and Clinical Health Act (HITECH) Act, Pub.L. 111-5; Feb 17, 2009. Available at: http://www.gpo.gov/fdsys/pkg/PLAW-111publ5/content-detail.html (accessed Mar 2, 2012).

Some states have supplemented federal and local investments by establishing a state-level fund for HIT to support initiatives such as HIE and Patient-Centered Primary Care Homes. Oregon currently provides no state-level financial support for HIT. That lack of support could pose risks to Oregon's health system transformation if CCOs adopt HIT at too slow a pace to support rapid coordination of care and Medicaid cost reduction goals.

Priorities for Oregon's Health IT Fund should include supplementing federal incentives for EHRs targeting high-priority areas such as long-term care and behavioral health settings; supplementing federal and regional HIE efforts by sustaining statewide HIE services as ONC grant funds are depleted; developing public resources to complement private EHR/HIT efforts; expanding/extending technical assistance; supporting broadband connectivity; and/or supporting telehealth infrastructure.

Milestones:

- Legislation is introduced and passed in the 2013 legislative session.

Action Steps:

- Develop draft legislation for the 2013 session. Work with legislators and stakeholders to determine the details of the funding mechanism, governance and implementation components.
- Reconvene the Technology Workgroup under HITOC; define technical solutions for public resources and HIE phase 2 services.
- Reconvene the Finance Workgroup to provide guidance on HIE phase 2 services funding approaches.

Strategy 2) Advance the value of HIT for consumers

Background:

Consumer engagement in health IT has great potential to spur both the health care system's use of EHRs, as well as patients' ability to take control of their medical care and health. Part of that engagement involves encouraging the use of personal health records (PHRs), which have had slow adoption by consumers. But several factors are starting to boost their use: patient portals sponsored by health care organizations and health plans that make it simple for consumers to access their information; simplified PHRs such as Microsoft's HealthVault and the expansion of the Veterans Administration's Blue Button health record tool; and the EHR Incentive Program meaningful use requirement that providers be prepared to provide patients with electronic copies of their health information upon request. Also, Direct has been designed to have the potential to give patients access to their health information through the use of a Direct Secure Messaging account.

Consumer engagement may also occur via the expanded use of mobile devices both by consumers and within the health care system. Not only do mobile devices have the potential to allow patients to keep some basic health information with them at all times, but there are also mobile applications designed to help consumers manage health conditions or have their health status monitored by a provider.

In Oregon, a number of efforts are underway related to the deployment of PHR systems and patient portals. Provider-based tethered PHRs are currently supported by organizations such as Kaiser Permanente and Oregon Health & Science University (Epic's MyChart), DCIPA's UmpquaOneChart and PeaceHealth. A number of health plans offer tethered PHRs such as Providence Health Plan (WebMD), Regence Blue Cross/Blue Shield, ODS Health Plan (WorldDoc with synchronization through HealthVault). Planning for future CareAccord™ services will assess the potential to enable consumers to receive their protected health information by means of secure email to PHRs.

Resources and educational materials, designed to meet the needs of Oregon's diverse communities, should be developed to engage patients in the potential of HIT, so that they can improve their health, interactions with the health care system and health care experience. Providers should be supported in finding opportunities to use HIT to engage with patients and educating patients about those opportunities. As consumers become more aware of the potential, it is expected that increasing consumer demand will become a driver for the adoption of health IT applications and use.

Milestones:

- Develop a consumer engagement plan including appropriate provider materials.
- Develop policies needed to support the transmission of information through CareAccord™ to consumers' PHRs.

Action Steps:

- Collaborate with patient advocacy organizations and other stakeholder groups to share information and identify areas of unmet needs and ensure that the consumer engagement plan addresses the needs of all communities in Oregon.

- Develop materials for consumers about how they can use and benefit from HIT.
- Develop materials for providers about engaging with patients through HIT and widely distribute those materials, including as part of technical assistance to providers; encourage providers to talk with patients about HIT.
- Convene a workgroup on PHRs to recommend to HITOC approaches to support PHRs as a method for consumers to effectively and securely manage their health information.
- Leverage the work of organizations such as the Agency for Healthcare Research and Quality (AHRQ) on the adoption and use of patient-centered HIT resources.

Strategy 3) Focus on interoperability as a key component to drive public and private HIT adoption

Background:

Standards-based health IT systems are needed to effectively collect data and exchange information for care coordination and improved health care. As the marketplace for EHRs has grown, separate vendors have produced proprietary products that do not interact with one another; this is one of the major reasons why HIE has not progressed more rapidly. Federal efforts sponsored by working groups of the ONC are working to break down these barriers. Federal EHR certification standards are intended to promote interoperability, among other goals, over time. Direct Secure Messaging has been developed as a simple, easily accessible and non-proprietary technology to offer an introductory method for securely exchanging patient information.

HITOC has followed federal standards for interoperability in its strategic and operational plans for HIE and has made Direct Secure Messaging an essential component of the CareAccord™ statewide HIE. This strategy places Oregon among the leading states in working toward the goal of national interoperability, and in achieving the cost and care quality advantages of HIE interoperability.

Oregon should continue to position itself as an early adopter of federal standards and monitor and respond to gaps in national standards. In addition, when the State provides financial support to health IT users, the support should include requirements to use standards-based technologies to improve interoperability and to further the goal of effective HIE. Terms used to describe health IT concepts should be clearly defined so that all users can understand each other and communicate effectively.

For EHRs, HIE and telehealth, Oregon should encourage or, where possible, require stakeholders across the continuum of provider types to adopt only technology that aligns with federal standards and standards required for care coordination. Standards should support extensibility so that systems have the flexibility to accommodate the development of new technologies.

Milestones:

- Measure the current adoption and meaningful use of certified EHR systems by Oregon providers and hospitals.
- Increase the adoption and meaningful use of certified EHR systems so that all providers in Oregon meet the benchmarks set for CCOs' adoption and meaningful use.
- Increase the percentage of providers who are actively exchanging information outside their immediate practice settings using the Direct protocol or other electronic mechanism, as measured by a survey of providers.
- Develop protocols for health information service provider (HISP)-to-HISP exchange.

Action Steps:

- Develop a best-in-class engagement process to register participants for CareAccord™ and help them to use Direct Secure Messaging services.

- Appoint participants in national standards development conversations to report to HITOC.
- Develop a public recognition campaign for providers achieving meaningful use and actively participating in information exchange.
- Pursue additional grant opportunities to support accelerated adoption of certified EHR systems and use of HIE.
- Establish policies that ensure the trust and security standards are met by all participants in the HIE marketplace in Oregon.
- Seek opportunities to give voice to Oregon EHR users' experiences and needs and to identify avenues to influence future EHR usability requirements.

Strategy 4) Embrace an enterprise architecture approach to state HIT systems

Background:

Opportunities should be explored to leverage health IT systems across multiple programs. For example, a provider directory could be used not only by CareAccord™ for HIE services, but also by the Health Insurance Exchange (HIX) and eligibility and enrollment systems. Similarly, a master patient index could potentially serve the needs of multiple programs. By building an enterprise architecture approach, multiple programs also may be able to introduce "one stop shopping" for providers who send information to the state, thus simplifying workflows and reducing burdens on providers. Work is already underway to streamline the eligibility determination and enrollment process for Oregonians receiving state services. This work should reduce the burden of multiple applications, and it should continue to be a high priority.

Meanwhile, Oregon's federal partners require coordination when states seek CMS funds for Medicaid technology investments. CMS's Seven Conditions and Standards for enhanced funding require reusing and leveraging Medicaid technologies and systems within the state. States also are required to complete self-assessments and roadmaps to maturity using Medicaid Information Technology Architecture (MITA), a framework developed by CMS to provide guidance on assessing and integrating business and IT needs and capabilities. In Oregon, the MITA framework serves as the foundation for the Healthcare Information Technology Architecture (HITA).

To the greatest extent possible, all federal funds for HIT activities--including HIE, HIX, eligibility and enrollment systems and Medicaid payment systems--implemented by the State of Oregon should be maximally aligned and leverage each other, to make the most efficient use of resources.

Milestones:

- Key parties agree on an actionable three-year state health and human services technology plan based on a unified enterprise architecture design and using national architecture standards.

Action Steps:

- Encourage OHA and DHS to form a steering committee to develop the three-year technology plan.
- Inventory work underway and establish sequence and priority of technology development.
- Develop an outline for one significant technology alignment that demonstrates an improvement in efficiency and a reduction in duplicative work processes for Oregon health care professionals.
- Ensure that systems support accessibility to state programs for all eligible individuals and families.
- Offer webinars or other opportunities to share knowledge gained through the Health Information Technology Architecture (HITA) State Self-Assessment.
- Leverage opportunities to expand the HITA work into the Human Services areas.

- Prioritize continuing work to streamline the eligibility determination and enrollment process for Oregonians receiving state services.

Strategy 5) Encourage HIT in emerging care systems that have alternate payment structures

Background:

Use of information technology in health care has always been behind the curve of IT use in other industries. Consumers often experience the advantages of information technology more at the grocery store, bank or auto repair shop, than at their doctor's office. The fee-for-service payment system for medical care is a major cause for the delayed adoption of IT solutions in health care. IT solutions are often harder to bill for than traditional, non-IT-dependent medical approaches, and the health care market trends toward billable solutions.

Recent health reform efforts in Oregon suggest that there will be greater opportunities than ever before for HIT to flourish in a non-fee-for-service environment.

The non-fee-for-service environment of coordinated care organizations (CCOs), accountable care organizations (ACOs) and other emerging payment models should be leveraged to encourage the adoption and use of all types of HIT, and Oregon should explore opportunities for HIT/HIE requirements in pilot alternative payment models that could be pursued by the Public Employees Benefit Board (PEBB) and the Oregon Educator Benefit Board (OEBB), as well as in the commercial marketplace.

Milestones:

- Collaborate with large entities such as PEBB and OEBB to develop pilot alternative payment models that realize the potential of HIT/HIE to improve care and lower costs.
- CCO requirements are updated to include alternative payment models that encourage HIT/HIE.

Action Steps:

- Develop materials that can be distributed to CCO innovator agents and other interested stakeholders outlining potential benefits of HIT in a non-fee-for-service environment, and first steps for providers and organizations to consider.
- Develop materials supporting the cost-savings potential of HIT in a non-fee-for-service environment.
- Develop standards-based templates in CareAccord™ that providers who do not yet have certified EHR systems may use to exchange information for care coordination.

Strategy 6) Extend technical assistance availability

Background:

Providers need technical assistance if they are to fully realize the potential of health IT to improve health and health care and to lower costs. Specific types of providers are not currently served by the grants-supported technical assistance programs of such organizations as OCHIN/O-HITEC. A gap analysis study would identify the providers in greatest need of technical help; with an audience identified, it would be easier to know what kind of services are needed and how to design technical assistance services. Funding for expanded technical assistance could come from the proposed HIT Fund (see Strategy 1) and from sliding-scale fees, among other sources.

Oregon should pursue opportunities to increase technical assistance, including possibilities for growth and collaboration between OCHIN/O-HITEC, the emerging Patient-Centered Primary Care Home (PCPCH) Institute, and CCO innovator agents. Technical assistance should support providers' adoption of HIT and be responsive to the varied needs of providers across the state. Depending on provider type, population served and geographic area served, technical assistance should be offered on a sliding scale basis.

Milestones:

- Develop a strategy for expanded technical assistance to make the best use of funds available through the HIT Fund and any other available resources.

Action Steps:

- Perform gap analysis to determine best approaches to extend technical assistance.
- Offer webinars, possibly in collaboration with the Centers for Medicare and Medicaid Services (CMS) and with Oregon organizations, to reach out to providers and better understand their technical assistance needs.
- Work with professional organizations and providers across the state to identify needs of different provider types and practice types and settings.
- Convene key parties.

Strategy 7) Develop a data strategy for statewide analytics

Background:

Multiple efforts are underway at national and state levels, by governmental and nongovernmental entities, to improve the collection of health data and to use it to improve health and health care and lower costs. A data strategy for statewide analytics should be designed to align existing efforts and resources, decrease reporting burdens, protect privacy and security, provide appropriate levels of access and tailor analytics to meet the needs of Oregon's diverse stakeholders. Developing a data strategy will require careful thought about the purposes for which data is or will be collected. Over time, analytics should evolve from descriptive uses and should include usable and actionable data. Achieving the potential of health analytics will take time, and a data strategy will help identify priorities and initial steps toward long-term goals.

This would be carried out in close collaboration with other State entities that are using data in a variety of ways to improve the population's health and the health care system in Oregon. These include the Oregon Health Authority's Medicaid Health System Transformation project, for which data on quality and efficiency of care will be central to the success of CCOs. HITOC should use feedback from the CCOs and OHA on their use of data for care coordination. It would also be fruitful to work closely with Oregon's Patient-Centered Primary Care Home Institute, developed by OHA, the Northwest Health Foundation and the Oregon Health Care Quality Corporation, which will be providing technical assistance to primary care practices using the medical home model.

Analytics can support improvements in health care and health equity. CCO planning and implementation has produced a data strategy for initial CCO efforts, but a longer-term strategy should be developed out of the OHA Office of Health Analytics to reduce the reporting burden on providers and to leverage private analytics efforts, the capabilities of Oregon Health Care Quality Corporation, public health population-based analytics and other existing work. The strategy should be flexible enough to support the needs of communities across the state. To maximize the use of currently available data, programs should be developed for getting data from analytics efforts back to stakeholders in a way that will allow them to improve care, including measurable improvements in health equity. Programs could include a website with centralized resources. These programs should leverage existing private market efforts.

Milestones:

- Map provider data reporting requirements to local, state and federal health agencies.
- Agree to a strategy to streamline provider data reporting requirements to health agencies.
- Identify two or three projects underway as pilots to demonstrate measurable results.

Action Steps:

- Perform an environmental scan to inventory and assess efforts that are already underway and to identify needs.

- Convene representatives from the agencies to which providers are required to report data, including the CCO Metrics and Scoring Committee, and discuss solutions to ease provider burden such as data use agreements and shared data collection.
- Seek appropriate opportunities for grant funding to support improved data reporting infrastructure and analytics.
- Develop Quality Workgroup or use existing forum.
- Convene stakeholders to identify key reports that providers will use and value.
- Convene Technology Workgroup under HITOC to evaluate report delivery mechanism(s), seeking input from and sharing evaluations with the CCO Metrics and Scoring Committee and stakeholders.
- Determine two or three key projects to create early results.

Strategy 8) Coordinate the efforts of all HIT-related initiatives in Oregon

Background:

Federal HIT grantees in Oregon meet on a quarterly basis. Among those represented at these meetings are Oregon Health and Science University (OHSU), Oregon Health Care Quality Corporation, OCHIN/O-HITEC, Patient-Centered Primary Care Home project, Portland Community College (whose federal funding for health IT workforce development has now expired), Medicaid Health Information Technology Project, Oregon Health Insurance Exchange and Oregon Health Network. These sessions offer opportunities for each participant to share information and updates on recent projects and note opportunities for synergy.

Other stakeholders working on HIT-related initiatives could participate in these meetings as well, giving them an opportunity to become aware of the wide range of HIT work in Oregon and to determine if their own work aligns with this strategic plan for HIT. In addition, coordinating efforts may support connections that can encourage the growth of Oregon's health IT economic sector, especially as Oregon's health system transformation sparks innovation in healthcare delivery.

Building on previous coordination among federal HIT grantees, all HIT-related initiatives in Oregon (including telehealth, broadband connectivity, HIX, health system transformation efforts, health analytics, workforce development and public health initiatives) should regularly convene and share information relevant for collaboration to HITOC with the goal of aligning efforts, sharing resources and leveraging common outreach efforts.

Milestones:

- Hold quarterly meetings of HIT-related initiatives.
- Bring together stakeholders on HIT workforce development issues.

Action Steps:

- Leverage existing Federal Grantee Coordination meeting and expand its participant base.
- Develop dashboard for progress updates; report information back to HITOC and share it with stakeholders.
- Identify key activities to leverage results and advance the strategies identified in Oregon's Strategic Plan.
- Conduct an HIT workforce needs assessment based on current and future (three to five year time horizon) needs.
- Conduct an inventory of current educational offerings in Oregon.
- Convene a series of regional meetings to identify current workforce, education and training gaps and recommend how to close those gaps.

Strategy 9) Use HIT to advance population health

Background:

Health information technology can provide powerful tools to improve individual patient care, including opportunities to help ensure reliable availability and exchange of information between health care providers and coordination of care. These tools also can help empower individual patients. But the benefits of adoption of health IT go beyond individual patient care. Exchange and analysis of data collected using health IT tools with public health partners could enhance Oregon's ability to understand the health status of its population, develop policies to improve population health, address equity and reduce health care disparities, monitor prevention initiatives, send alerts and evaluate the impact of policy and prevention initiatives on the health of Oregon's population. These activities can help support achievement of the triple aim goal to improve population health.

To realize the benefits of these tools, Oregon should develop a prioritized list of specific and actionable opportunities for health IT to advance population health in Oregon. Input from experts at the Centers for Disease Control, ONC, academia, and community-initiated efforts such as the ONC Standards and Interoperability Framework Public Health Reporting Initiative should be drawn upon for development of this list. Prioritization would be based on the potential magnitude of impact on population health; feasibility of implementation; opportunities to increase efficiency and coordination of the public health system; and alignment with the Public Health Division's strategic plan, the Oregon Health Policy Board's Action Plan for Health, the work of the Office of Equity and Inclusion, and the meaningful use criteria promulgated by CMS and ONC.

In carrying out all of the strategies identified in Oregon's Strategic Plan for Health IT, population health opportunities should be incorporated into health IT planning. Priority population health-related activities should be woven through the other strategies described in this plan as appropriate. This information would be useful for HITOC and for policymakers to consider as health IT planning is undertaken.

The primary strategic actions are to develop a prioritized list of specific and actionable opportunities for health IT to advance population health in Oregon and a strategy for incorporating those opportunities in health IT planning.

Milestones

- Convene a HITOC workgroup on population health to identify health IT opportunities to advance population health.
- Develop a prioritized list of specific and actionable opportunities for health information technology to advance population health in Oregon.
- Develop a plan to set measurable goals to incorporate population health priorities into HITOC's work and strategies for health IT.
- Identify and describe improvements in population health that can be enhanced through health IT policy and planning guidance.

- Identify and describe improvements in the state's public health infrastructure that can be enhanced through health IT policies and planning.

Action Steps

- Recruit members for HITOC workgroup on population health.
- Convene workgroup and consult with CDC, ONC, and academia to identify a list of specific and actionable opportunities for health information technology to advance population health in Oregon.
- Draft a prioritized list of these opportunities for presentation to HITOC leadership for consideration.
- Convene workgroup and HITOC leadership to develop a strategy for incorporation of the prioritized list into HITOC's health information technology planning efforts.
- Draft a report that weaves the priority opportunities among the other strategies outlined in Oregon's Strategic Plan for Health Information Technology.
- Present the report to HITOC for consideration and adoption.
- Present the report to policy makers to consider as health information technology planning is undertaken.

Conclusion

Oregon's place at the leading edge of health care policy development continues with the Medicaid CCO project, making it particularly important that HITOC remain aware of the latest issues in health IT and plan strategically for the future. This strategic plan looks forward just three years because of the fast-moving technology and marketplace innovations taking place in Oregon and nationally. By mapping out a strategic vision and the action steps to see that vision through, Oregon will remain among the leading states in improving the health and health care of its citizens, and using health IT to get there.

Appendix A: Glossary of Health IT and Related Terms

Except where noted with an asterisk (*), all definitions in this glossary are taken from the National eHealth Collaborative, "Health Information Exchange Roadmap: The Landscape and a Path Forward," April 2012, available at http://www.nationalehealth.org/HIE-roadmap.

Accountable Care Organization: An accountable care organization (ACO) is a type of payment and delivery reform model that seeks to tie provider reimbursements to quality metrics and reductions in the total cost of care for an assigned population of patients. A group of coordinated health care providers form an ACO, which then provides care to a group of patients. The ACO may use a range of payment models (capitation, fee-for-service with asymmetric or symmetric shared savings, etc.). The ACO is accountable to the patients and the third-party payer for the quality, appropriateness, and efficiency of the health care provided. According to the Centers for Medicare and Medicaid Services (CMS), an ACO is "an organization of health care providers that agrees to be accountable for the quality, cost, and overall care of Medicare beneficiaries who are enrolled in the traditional fee-for-service program who are assigned to it."

Beacon Community: A grant program sponsored by the Office of the National Coordinator for Health IT (ONC) for communities to build and strengthen their existing health information technology infrastructure and exchange capabilities. These communities demonstrate the vision of a future where hospitals, clinicians, and patients are meaningful users of health IT and together the community achieves measurable improvements in health care quality, safety, efficiency, and population health.

BioSense Initiative: BioSense is a Centers for Disease Control and Prevention (CDC) initiative to support enhanced biosurveillance, early detection, quantification, and localization of possible biologic terrorism attacks and other events of public health concern on a national level. The goals of the BioSense initiative are to advance early detection by providing the standards, infrastructure, and data acquisition for near real-time reporting, analytic evaluation and implementation, and early event detection support for state and local public health officials.

Biosurveillance: While there is no commonly accepted definition of biosurveillance, it typically refers to automated monitoring of existing health data sources to identify trends that may indicate naturally occurring or intentional disease outbreaks. Such data may supplement traditional surveillance and disease reporting methods.

Bundled payments: Payments are referred to as bundled when the unit of payment includes multiple individual services. For instance, hospitals receive a single bundled payment from Medicare for each discharge; that payment covers all of the services provided by the hospital during the stay, including nursing, room and board, operating room fees, and so on. In general, bundled payments offer providers an incentive to reduce the costs of the services within each component of the bundle and to increase the efficiency with which they provide medical care.

Certificate authority: A certificate authority (CA) is an authority in a network that issues and manages security credentials and public keys for message encryption. As part of a public key infrastructure (PKI), a CA checks with a registration authority (RA) to verify information provided by the requestor of a digital certificate. If the RA verifies the requestor's information, the CA can then issue a certificate. Depending on the public key infrastructure implementation, the certificate includes the owner's public key, the expiration date of the certificate, the owner's name, and other information about the public key owner. See also: registration authority, digital certificate, public key infrastructure.

Certification criteria: Certification of Health IT products will provide assurance to purchasers and other users that an EHR system, or other relevant technology, offers the necessary technological capability, functionality, and security to help them meet the meaningful use criteria established for a given phase. Providers and patients must be confident that the electronic health IT products and systems they use are secure, can maintain data confidentiality and can work with other systems to share information. Confidence in health IT systems is an important part of advancing health IT system adoption and allowing for the realization of the benefits of improved patient care. Certification criteria are determined by regulations led by ONC.

Continuity of care document (CCD): The Continuity of Care Document (CCD) specification is an XML-based markup standard intended to specify the encoding, structure and semantics of a patient summary clinical document for exchange. The CCD specification is a constraint on the HL7 Clinical Document Architecture (CDA) standard. The patient summary contains a core data set of the most relevant administrative, demographic, and clinical information facts about a patient's healthcare, covering one or more healthcare encounters. It provides a means for one healthcare practitioner, system, or setting to aggregate all of the pertinent data about a patient and forward it to another practitioner, system, or setting to support the continuity of care. Its primary use case is to provide a snapshot in time containing the pertinent clinical, demographic, and administrative data for a specific patient.

CONNECT: CONNECT is an open source software stack and community that implements health exchange specifications. CONNECT enables secure electronic health data exchange among healthcare providers, insurers, government agencies and consumer services. CONNECT was originally developed by the Federal Health Architecture to provide a common and compliant gateway to connect federal agencies to the Nationwide Health Information Network Exchange and was released for open source use in 2009. The CONNECT roadmap also includes support for the Direct specifications, which will allow any organization using CONNECT to implement the Direct specifications.

*** Coordinated Care Organization (CCO):** CCOs are local health entities that will deliver health care and coverage for people eligible for the Oregon Health Plan (Medicaid), including those also covered by Medicare. CCOs must be accountable for health outcomes of the population they serve. They will have one budget that grows at a fixed rate for mental, physical and ultimately dental care. CCOs will bring forward new models of care that are patient-centered and team-focused. They will have flexibility within the budget to deliver defined outcomes. They will be governed by a partnership among health care providers, community members, and stakeholders in the health systems that have financial responsibility and risk.

Data Use and Reciprocal Support Agreement (DURSA):

The DURSA is the legal multi-party trust agreement that is entered into voluntarily by all entities, organizations and Federal agencies that desire to engage in electronic health information exchange with other members of the Nationwide Health Information Network Exchange.

Digital certificate: A digital certificate is an electronic "credit card" that establishes an individual's credentials when doing business or other transactions on the Web. It is issued by a certificate authority (CA). It contains the certificate holder's name, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting messages and digital signatures), and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real. Some digital certificates conform to a standard, X.509. Digital certificates can be kept in registries so that authenticating users can look up other users' public keys. See also: certificate authority, registration authority, public key infrastructure.

Electronic health record (EHR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization.

Electronic medical record (EMR): An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization.

Electronic order entry: Computerized physician order entry (CPOE) (also sometimes referred to as computerized provider order entry or electronic order entry) is a process of electronic entry of medical practitioner instructions for the treatment of patients under hi s or her care. These orders are communicated over a computer network to the medical staff or to the departments (pharmacy, laboratory, or radiology) responsible for fulfilling the order. CPOE decreases delay in order completion, reduces errors related to handwriting or transcription, allows order entry at the point of care or off site, provides error checking for duplicate or incorrect doses or tests, and simplifies inventory and posting of charges.

*** Enterprise Architecture:** Enterprise Architecture (EA) is the practice of applying a comprehensive and rigorous method for describing a current and/or future structure and behavior for an organization's processes, information systems, personnel and organizational sub-units, so that they align with the organization's core business strategies.

Federal Health Architecture: The Federal Health Architecture (FHA) is an E-Government Line of Business initiative managed by the Office of the National Coordinator for Health IT (ONC). FHA was formed to coordinate health IT activities among the more than 20 federal agencies that provide health and healthcare services to citizens. FHA and its federal partners are helping build a federal health information technology environment that is interoperable with private sector systems and supports the President's plan to enable better point-of-service care, increased efficiency and improved overall health in the U.S. population. FHA is responsible for supporting federal efforts to deploy health IT standards and ensuring that federal agencies can seamlessly exchange health data among themselves, with state, local and tribal governments, and with the private sector.

Fee-for-service payments: Fee-for-service is a payment model where services are unbundled and paid for separately. In the health insurance and the healthcare industries, fee-for- service occurs when doctors and other

healthcare providers receive a fee for each service, such as an office visit, test, procedure, or other healthcare service. Payments are issued retrospectively, after the services are provided. Fee-for-service is the dominant physician payment method in the United States. This is the opposite structure to accountable care payment models.

Formulary: A formulary is a list of prescription drugs covered by a particular drug benefit plan.

Health information exchange (HIE): VERB - The electronic movement of health-related information among organizations according to nationally recognized standards.

Health information exchange (HIE): NOUN - An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards. See also: health information organization (HIO) and regional health information organization (RHIO).

Health information organization (HIO): An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards. See also health information exchange (HIE) and regional health information organization (RHIO).

Health Information Service Provider (HISP): A Health Information Service Provider, or HISP, is a logical concept that encompasses certain services that are required for Direct Project exchange, such as the management of trust between senders and receivers. It may be a separate business or technical entity from the sender or receiver, depending on the deployment option chosen by the implementation.

Health Information Technology for Economic and Clinical Health (HITECH) Act: The Health Information Technology for Economic and Clinical Health (HITECH) Act seeks to improve American health care delivery and patient care through an unprecedented investment in health information technology. The provisions of the HITECH Act are specifically designed to work together to provide the necessary assistance and technical support to providers, enable coordination and alignment within and among states, establish connectivity to the public health community in case of emergencies, and assure the workforce is properly trained and equipped to be meaningful users of EHRs. Combined, these programs build the foundation for every American to benefit from an electronic health record, as part of a modernized, interconnected, and vastly improved system of care delivery.

Health IT Policy Committee: The Health IT Policy Committee is an advisory committee, as defined in the Federal Advisory Committee Act, created for the purpose of making recommendations to the National Coordinator for Health IT on a policy framework for the development and adoption of a nationwide health information infrastructure, including standards for the exchange of patient medical information.

Health IT Standards Committee: The Health IT Standards Committee, a federal advisory committee like the Health IT Policy Committee, is charged with making recommendations to the National Coordinator for Health IT on standards, implementation specifications, and certification criteria for the electronic exchange and use of health information.

Healthcare quality: The Institute of Medicine defines healthcare quality as the extent to which health services provided to individuals and patient populations improve desired health outcomes. The care should be based on the strongest clinical evidence and provided in a technically and culturally competent manner with good communication and shared decision making.

*** Interoperability:** The Healthcare Information and Management Systems Society (HIMSS) defines interoperability as "the ability of health information systems to work together within and across organizational boundaries in order to advance the effective delivery of healthcare for individuals and communities." HIMSS. "Interoperability Definition and Background." June 9, 2005. http://www.himss.org/content/files/interoperability_definition_background_060905.pdf.

Master patient index: Healthcare organizations or groups of them will implement a master patient index (MPI) to identify, match, merge, de-duplicate, and cleanse patient records to create a master index that may be used to obtain a complete and single view of a patient. The MPI will create a unique identifier for each patient and maintain a mapping to the identifiers used in each record's respective system.

Meaningful Use criteria: The American Recovery and Reinvestment Act of 2009 specifies three main components of Meaningful Use: 1) The use of a certified EHR in a meaningful manner, such as e-prescribing; 2) The use of certified EHR technology for electronic exchange of health information to improve quality of healthcare; 3) The use of certified EHR technology to submit clinical quality and other measures. Simply put, "meaningful use" means providers need to show that they are using certified EHR technology in ways that can be measured significantly in quality and in quantity. The criteria for meaningful use will be staged in three steps over the course of the next five years: Stage 1 (2011 and 2012) sets the baseline for electronic data capture and information sharing; Stage 2 (expected to be implemented in 2014) and Stage 3 will continue to expand on this baseline and be developed through future rulemaking.

National eHealth Collaborative: National eHealth Collaborative (NeHC) is a public-private partnership focused on accelerating progress toward widespread, secure and interoperable nationwide health information exchange to improve health and healthcare. NeHC's neutrality and diverse multi-stakeholder participation provides a unique platform for collaboration. NeHC educates, connects, and encourages healthcare stakeholders to advance health information technology and health information exchange nationwide through its NeHC University web-based education program, its Consumer Consortium on eHealth, its support of the Nationwide Health Information Network Exchange, its collaborative online community and its ongoing study of leading health information exchanges. National eHealth Collaborative is a cooperative agreement partner of the Office of the National Coordinator for Health IT within the U.S. Department of Health and Human Services.

Nationwide Health Information Network: The nationwide health information network is the portfolio of nationally recognized services, standards and policies that enable secure health information exchange over the Internet. Often also used as an umbrella term to describe the result of standards harmonization and pilot testing activities led by the ONC Office of Standards and Interoperability.

Nationwide Health Information Network Exchange: The Nationwide Health Information Network Exchange ("Exchange") is a group of federal agencies and non-federal organizations that came together under a common mission and purpose to improve patient care, streamline disability benefit claims, and improve public health reporting through secure, trusted, and interoperable health information exchange.

Office of the National Coordinator for Health Information Technology: The Office of the National Coordinator for Health Information Technology (ONC) is the principal Federal entity charged with coordination of nationwide efforts to implement and use the most advanced health information technology and the electronic exchange of health information The position of National Coordinator was created in 2004, through an Executive Order, and legislatively mandated in the Health Information Technology for Economic and Clinical Health Act (HITECH Act) of 2009.

Patient centered medical home: A patient centered medical home integrates patients as active participants in their own health and wellbeing. Patients are cared for by a physician who leads the medical team that coordinates all aspects of preventive, acute and chronic needs of patients using the best available evidence and appropriate technology. These relationships offer patients comfort, convenience, and optimal health throughout their lifetimes.

Patient consent: There are five generally accepted models for defining patient consent to participate in an HIE. The no- consent model does not require any agreement on the part of the patient to participate in an HIE. The opt-out model allows for a predetermined set of data to be automatically included in an HIE but a patient may still deny access to information in the exchange. The opt-out with exceptions exchange enables the patient to selectively exclude data from an HIE, limit information to specific providers, or limit exchange of information to exchange only for specific purposes. The opt-in model requires patients to specifically affirm their desire to have their data made available for exchange within an HIE. The opt-in with restrictions model allows patients to make all or some defined amount of their data available for electronic exchange.

Patient Protection and Affordable Care Act: The federal Patient Protection and Affordable Care Act (P.L. 111-148), signed March 23, 2010, as amended by the Health Care and Education Reconciliation Act, signed March 31, 2010, is also referred to as the Affordable Care Act (ACA), or simply as "federal health reform." The 900+ page act contains many provisions, with various effective dates. Provisions included in the ACA are intended to expand access to insurance, increase consumer protections, emphasize prevention and wellness, improve quality and system performance, expand the health workforce, and curb rising health care costs.

Personal health record (PHR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual.

Private HIE: The term "private" HIE generally refers to HIEs which operate under the governance of an integrated delivery network (IDN) or a single healthcare system. The term "enterprise HIE" is often substituted in this context.

Public HIE: The term "public" HIE is generally used to describe HIEs which are community-based and are open to, and governed by, participants from multiple organizations. Public HIEs often rely on grants to help them get established and then require a solid revenue stream to become sustainable. Note, however, that public HIEs are not in fact always totally funded with public or government funds.

Provider directory: Provider directories are like an electronic "yellow pages " of healthcare providers. A provider directory is a core requirement for accomplishing secure directed exchange to a previously unknown entity.

Public key infrastructure: A PKI (public key infrastructure) enables users of a basically unsecure public network such as the Internet to securely and privately exchange data and money through the use of a public and a private cryptographic key pair that is obtained and shared through a trusted authority. The public key infrastructure provides for a digital certificate that can identify an individual or an organization and directory services that can store and, when necessary, revoke the certificates. See also: certificate authority, digital certificate, registration authority.

Publish/subscribe: Often abbreviated to pub/sub, publish/subscribe is a messaging pattern where senders of messages, called publishers, do not program the messages to be sent directly to specific receivers, called subscribers. Published messages are characterized into classes, without knowledge of what, if any, subscribers there may be. Subscribers express interest in one or more classes, and only receive messages that are of interest, without knowledge of what, if any, publishers there are. Pub/sub is often used to submit public health information.

Push and send: Push and send refers to one-directional electronic messaging such as those for which The Direct Project has developed standards and specifications for secure transport. In push messaging, as in email, the receiver of the message must be a known entity.

Query/retrieve: Often used in the context of the Nationwide Health Information Network Exchange, query/ retrieve refers to a messaging pattern in which a query is initiated from one participating health information organization to another, requesting a list of available documents meeting the given query parameters for a particular patient for later retrieval.

Record locator service: In an HIE, a record locator service is the part of the system that determines what records exist for a member and where the source data is located. The record locator service includes these distinct functions: manage participating provider identities; maintain and publish a patient index; match patients using an algorithm; look up patient record locations (but not the records themselves); communicate securely and maintain an audit log; and manage patient consent to record sharing (under state laws and ARRA).

Regional Health Information Organization (RHIO): A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community. See also health information organization (HIO) and health information exchange (HIE).

Registration authority: A registration authority (RA) is an authority in a network that verifies user requests for a digital certificate and tells the certificate authority (CA) to issue it. RAs are part of a public key infrastructure (PKI), a networked system that enables companies and users to exchange information and money safely and securely. The digital certificate contains a public key that is used to encrypt and decrypt messages and digital signatures. See also: certificate authority, digital certificate, public key infrastructure.

Rulemaking: Rulemaking refers to the process that executive and independent agencies use to create, or promulgate, regulations. In general, legislatures first set broad policy mandates by passing statutes, then agencies create more detailed regulations through rulemaking. Legislatures typically rely on rulemaking to add more detailed scientific, economic, or industry expertise to a policy--fleshing out the broader mandates of authorizing legislation. For example, the HITECH Act called for healthcare providers to meaningfully use a certified EHR in order to be eligible for financial incentives. It was then the job of the U.S. Department of Health and Human Services to define "meaningful use" and "certified EHR" through the rulemaking process. Rulemaking generally has multiple phases built into the process in order to accommodate several rounds of public comment.

Specifications: A specification (often abbreviated as spec) is an explicit set of requirements to be satisfied by a material, product, or service. Specs are a type of technical standard. A technical specification may be developed by any of various kinds of organizations, both public and private. Example organization types include a corporation, a consortium, a trade association, a national government (including its regulatory agencies and national laboratories and institutes), a professional association, or a purpose-made standards organization such as IS0.

Standards: The term "standard," or "technical standard" as cited in the National Technology Transfer and Advancement Act (NTTAA), includes all of the following: common and repeated use of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management systems practices; and the definition of terms; classification of components; delineation of procedures; specification of dimensions, materials, performance, designs, or operations; measurement of quality and quantity in describing materials, processes, products, systems, services, or practices; test methods and sampling procedures; or descriptions of fit and measurements of size or strength.

Standards & Interoperability Framework: The Standards and Interoperability (S&I) Framework is a set of integrated functions, processes, and tools being guided by the healthcare and technology industry to achieve harmonized interoperability for healthcare information exchange.

State Designated Entities (SDEs): Organizations appointed by each state that received ARRA/HITECH funding through the HIE Cooperative Agreement Program to establish or expand statewide exchange.

State HIE: The state HIE provides alignment of architecture, technology and policy throughout an individual state. Currently there are fifty-six states and territories planning and coordinating state level exchanges through a State Designated Entity. The state HIE typically manages funding provided by the Office of the National Coordinator (ONC) and assists specific HIEs within the state.

The Direct Project: The Direct Project specifies a simple, secure, scalable, standards-based way for participants to send authenticated, encrypted health information directly to known, trusted recipients over the Internet.

Virtual lifetime Electronic Record (VLER): The VLER initiative launched following President Obama's April 9, 2009 direction to the Department of Defense (DoD) and the Department of Veterans Affairs (VA) to create a unified lifetime electronic health record for members of the U.S. Armed Services. VLER will contain both administrative (i e personnel and benefits) and medical information for Service members and Veterans. VLER will provide access to information from day one of a Service member's military career through transition to Veteran status and beyond.