

# ONC Exemplar HIE Governance Program

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## EHR|HIE Interoperability Workgroup's Governance Best Practices & Standards Alignment Project **Federated Provider Directories Pilots** Final Report

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This report was created by the EHR|HIE Interoperability Workgroup under a cooperative agreement with the Office of the National Coordinator for Health Information Technology. The content, views and opinions do not necessarily reflect those of the Department of Health and Human Services or the Office of the National Coordinator for Health Information Technology.

## Executive Summary

Effective and efficient communication between healthcare providers is of the utmost importance in regard to patient safety, continuity of care, and positive outcomes. As the United States healthcare system rapidly leverages technology such as electronic health records (EHRs) and other forms of health information technology rather than paper-based systems, the mechanisms used to communicate amongst providers have evolved. The Direct Project was created to offer an easy, affordable, and scalable way to send secure clinical messages. In conjunction with the use of Direct, a Provider Directory manages healthcare provider information in a directory structure<sup>1</sup>. As is often common in an emerging area, the use of Provider Directories is not uniform and several technical standards and implementation strategies exist.

The Exemplar Health Information Exchange (HIE) Governance Program was developed to allow the Office of the National Coordinator for Health Information Technology (ONC) to work collaboratively with entities already involved in governance of health information exchange. ONC awarded an Exemplar HIE Governance Program grant to the New York eHealth Collaborative (NYeC) on behalf of the EHR|HIE Interoperability Workgroup (IWG). The IWG is a collaborative of 19 states and 47 EHR and HIE vendors, led by NYeC, which was created in 2011 in response to a lack of consistent interoperability standards in the market which allow for connectivity between disparate electronic health record systems (EHRs) and health information exchanges (HIEs).

The cooperative agreement that governed the IWG's Exemplar HIE grant was established to allow the IWG to continue its efforts in developing robust implementation specifications for 'plug and play' interoperability, specifically in the area of Provider Directories. To accomplish this goal, between May and December 2013, the IWG performed the following functions:

- Recruited four geographically diverse pilots demonstrating query and response capability of a federated set of Provider Directories representing five states (California, Florida, Michigan, New York, and Utah) and nine vendors and/or homegrown systems
- Monitored and supported pilots with facilitation and technical support, working in collaboration with other Provider Directory federation efforts occurring around the country
- Coordinate with the ONC Modular Specifications Initiative<sup>2</sup> (ModSpec)
- Established measures for data reporting on pilots for ONC; report data from pilots to ONC on quarterly and bi-annual intervals
- Bring lessons learned and suggested modifications to the IWG Direct Exchange specifications back to the IWG membership and the Standards and Interoperability Framework (S&I)<sup>3</sup> community
- Update IWG draft implementation guide for the HPDPlus federated Provider Directory specifications

The experiences of the pilots led to the following lessons learned, program accomplishments, and recommendations for improvements related to Provider Directory specifications and tools:

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<sup>1</sup> Integrating the Healthcare Enterprise (IHE)

<sup>2</sup> <http://modularspecs.siframework.org/Provider+Directories+Homepage>

<sup>3</sup> <http://wiki.siframework.org/>

### **Lessons Learned**

1. The multitude of HPD standards and implementation guides has resulted in an incompatible set of Provider Directory deployments across the country.
2. The use of different provider specialty nomenclatures in different Provider Directories could affect interoperability between directories.
3. There was broad agreement that the new ModSpec specifications needed to go through the IHE approval process, in order to ensure widespread vendor acceptance.
4. The scope of all of the published implementation guides for Provider Directories did not include federation, nor any guidance regarding harmonization across an environment involving multiple Provider Directories.
5. There is widespread interest in the topic of Provider Directories, as evidenced by the large number of attendees on the monthly webinars for the pilots (even by non-pilot participants).

### **Accomplishments**

1. The IWG pilots allowed for the exploration of both technical and policy needs to create this new level of interoperability between Provider Directories.
2. The IWG's facilitation of conversations about the nuances in the technical standards and serving as a conduit to the work of the ModSpec project advanced a collaboration between IHE USA and the ModSpec project, ultimately leading to an update to the IHE specification for Provider Directories.
3. The IWG's Implementation Guide Appendix for HPDPlus has been updated to version 1.1.1 with the findings of the pilots.
4. The Provider Directory testing requirements for the HIE Certified® Direct test tool has been updated.

### **Recommended Improvements to Specifications and Implementation Guides**

- Issuance of a single HPD specification and an associated implementation guide with examples of appropriate Web Service Definition Languages (WSDLs).
- Develop a minimum data set that HISP's shall populate into their Provider Directories. Direct users need to be able to select with certainty the unique individual they are sending data to, so including phone numbers, street addresses for the practice, and specialties, at a minimum is critical.
- Development of reference implementation for the definitive standard and associated test suite(s).
- Development of a robust glossary of terms and applicable value sets.
- Provide a solution for supporting multi-parameter/multi-object use cases more efficiently.
- Better guidance on security, technology standards, and acceptable interoperability policies across state lines.

### **Recommended Improvements to Tools or Services**

- Provide or ensure the availability in the industry of an automated acceptance test suite that is able to issue a set of well-defined queries and verify the responses against a canonical provider database. If possible, allow the test utility to support a sequence of releases of the standard to allow for incremental adoption. It should be noted that the IWG Testing Tool is intended to assist in meeting these objectives and has the potential to permit parallel testing paths against different versions of specifications.
- Define a higher-level query Application Programming Interface (API) which scales better when transmitted over networks.

## Background

(The Exemplar Health Information Exchange (HIE) Governance Program was developed to allow the Office of the National Coordinator for Health Information Technology (ONC) to work collaboratively with entities already involved in governance of health information exchange, encouraging the continued development and adoption of policies, interoperability requirements, and business practices that will increase the ease of electronic health information exchange, reduce implementation costs, and assure the privacy and security of data being exchanged.

ONC awarded one of two of the Exemplar HIE Governance Program grants to New York eHealth Collaborative NYeC) on behalf of the EHR|HIE Interoperability Workgroup (IWG) in March, 2013. The second Exemplar HIE Grantee organization was DirectTrust.org (DirectTrust)<sup>4</sup>.

The IWG is a collaborative of 19 states and 47 EHR and HIE vendors, led by NYeC, which was created in 2011 in response to a lack of consistent interoperability standards in the market which allow for connectivity between disparate electronic health record systems (EHRs) and health information exchanges (HIEs). Connectivity, in this regard, pertains to Patient Record Lookup and Directed Exchange. For providers, the cost and complexity of interoperability between EHRs and HIEs is the major barrier to inter-system connectivity. The IWG was formed to address the problems related to interoperability standards and adoption. The IWG membership has come together to develop interoperability standards in a way that enables “plug and play” connectivity (not requiring customization or configuration for systems to exchange information). Since its inception, the IWG has been successful in engaging stakeholders, developing technical and functional specifications for Patient Record Lookup and Directed Exchange and designing a certification program by which EHR and HIE products would be testing against the standards.

The cooperative agreement that governed the IWG’s Exemplar HIE grant was established to allow the IWG to continue its efforts in developing robust implementation specifications for ‘plug and play’ interoperability for Provider Directories. As part of the cooperative agreement IWG planned to address the implementation challenges facing the exchange of health information as the federation and querying of Provider Directories become more prevalent. A primary goal for the IWG’s Exemplar HIE project was for the learnings from this project to translate into stronger implementation specifications in order to support, strengthen, and advance existing ONC efforts to improve the standards for Provider Directories in both Direct messaging and query-based exchange.

The importance of collaboration was recognized as a critical element for the success of this project from the beginning. In addition to the importance of ensuring that there be communication and alignment between the two Exemplar HIE grants, it was also important that the work of the IWG, through the Exemplar HIE grant, operate in a collaborative manner with other similar interstate efforts popping up around the country.

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<sup>4</sup> <http://www.directtrust.org/>

## Goals of Project

There was initially a three-prong scope to this Exemplar HIE Governance Program grant, focusing on Provider Directories, patient matching, and supporting the advancement of the ONC Governance Framework<sup>5</sup> through coordination. Before the official launch of the project, the patient matching scope was moved to a different area within ONC (and subsequently to a different ONC-funded contract), so work on that effort is not part of this report. Although it is very apparent that the coordination around HIE governance efforts is critical, and there was coordination and communication, both with DirectTrust and other ONC governance activities, the focus of this project was primarily around the identification, development and support of the Provider Directory pilots. Therefore this report will touch on all aspects of this project, but will primarily focus on the pilots and lessons learned.

### The initial goals of the project included the following elements

- Recruit approximately 5-7 pilot participants (states and vendors) for pilots demonstrating query and response capability of a federated set of Provider Directories, using HPDPlus for Direct exchange (between at least one electronic health record system (EHR) and one health information service provider (HISP) and between at least two HISPs).
- Monitor and support pilots with facilitation and technical support, working in collaboration with other Provider Directory federation efforts occurring around the country.
- Coordinate with the ONC Modular Specifications Initiative<sup>6</sup> (ModSpec) and participate in bi-weekly calls with ONC and ModSpec leadership.
- Establish measures for data reporting on pilots for ONC; report data from pilots to ONC on quarterly and bi-annual intervals.
- Bring lessons learned and suggested modifications to the IWG Direct Exchange specifications back to the IWG membership and the Standards and Interoperability Framework (S&I)<sup>7</sup> community.
- Update IWG draft implementation guide for the HPDPlus federated Provider Directory specifications.

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<sup>5</sup> [http://www.healthit.gov/sites/default/files/GovernanceFrameworkTrustedEHIE\\_Final.pdf](http://www.healthit.gov/sites/default/files/GovernanceFrameworkTrustedEHIE_Final.pdf)

<sup>6</sup> <http://modularspecs.siframework.org/Provider+Directories+Homepage>

<sup>7</sup> <http://wiki.siframework.org/>

## Identifying Pilot Participants

### Development of Criteria

Criteria were developed for prospective pilot participants around necessary technical and organizational capacity to participate fully and deliver on schedule. An evaluation of likely states and vendors meeting or exceeding the criteria was conducted with a goal to recruit a set of pilot participants who could demonstrate delivery of results based on a query linking two or more Provider Directories. Please see [Appendix 1: Initial outreach documents and criteria](#) for an overview of the criteria and examples of the information sent out to prospective pilot participants.

### Outreach

As the IWG began the process to recruit 5-7 states and vendors to participate in the federated Provider Directory pilots, there was a recognition that key lessons might be found from the State Health Policy Consortium's multi-state initiatives<sup>8</sup>, especially from the Western States Consortium (WSC) where an HPDPlus federated directory pilot had recently been demonstrated between California and Oregon, on behalf of the WSC.<sup>9</sup> Therefore, in addition to the 19 states that are IWG members, recruitment efforts were quickly broadened to over 25 other State HIE programs and state-designated HIE entities (SDEs), as well as some regional health information exchange organizations (RHIOs), vendors of Direct HISP services, and some EHR vendors. Outreach via phone calls and emails took place during the month of June 2013, informing potentially interested organizations of the pilot projects, and conducting research on the various standards and policies being used for Provider Directory implementations in the newly emerging Direct messaging environment.

During the month of July 2013, conversations continued among and between the interested potential pilot participants. Six meetings covering almost every region of the country were held with potential pilot teams about current capabilities around Provider Directories. In these conversations, the vendors for each of these organizations were invited to discuss their current and planned technical solutions for displaying provider information (individual and organizational demographic information and other data), as part of their Direct messaging solutions, or within an EHR for either Direct messaging or query HIE services. There were also ongoing discussions with vendors about the timing of having a Provider Directory with either HPDPlus and/or ModSpec standards ready to pilot, as several of the interested state and regional organizations were awaiting directory services from their vendors.

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<sup>8</sup> <http://www.rti.org/page.cfm?obj=F3B7A51B-5056-B155-2CD35F737C2964B3>

<sup>9</sup> <http://www.healthit.gov/sites/default/files/wscfinalreport.pdf>

## **Current Environment**

As a result of the conversations during the months of June and July 2013, wide variability in technical readiness for testing HPDPlus Provider Directory standards in HISP-to-HISP or EHR-to-HISP environments was discovered, as well as substantial confusion among vendors about the various technical standards being discussed or implemented.

Some state HIEs, RHIOs and SDEs were already engaging in Provider Directory aggregation models, sharing Excel or Comma Separated Values (CSV) files with each other on a regular basis. During the conversations for this project, this model of aggregating directory files was identified in Florida, Georgia, Hawaii, Michigan, North Carolina, and Tennessee, and it is a safe assumption there are others currently using this model as well. In these instances, organizations were making varying amounts of provider data available to each other to display in various formats, depending on the organizations' Provider Directory format and the amount of data collected within their systems.

Other states or SDEs may have their Provider Directory database made available to other HISPs using the same vendor (Utah, Pennsylvania to our knowledge), or may have a publicly published Provider Directory of Direct addresses—a “white pages” approach (Georgia (for Medicaid providers), Rhode Island).

In two instances, plans were underway to expand the work of the WSC, and examine more technically complex methods for a federated approach to providing access to Provider Directory information. The most advanced planning was occurring in the state of California, where the Office of Health Information Integrity (CalOHII) provided funding to establish the California Health eQuality (CHeQ) program within the Institute for Population Health Improvement (IPHI) at the University of California, Davis Campus (UC Davis). The CHeQ program in turn, provided grants to California RHIOs and HISPs to participate in the formation of a statewide hub for federated access to Provider Directory information in a network of organizations, both for Direct exchange and for query-based exchange. The CHeQ team, already underway with their recruitment efforts for participating organizations within the state of California at the time this project launched, was also instrumental in supporting the policy and technical development of the next phase of the WSC work which had been restructured as a nonprofit organization, known as the National Association for Trusted Exchange (NATE), using a peer to peer architecture.

## **Barriers to Participation**

While expressing interest in the concept of Provider Directory federation, some states cited capacity issues for their inability to participate in a pilot (Ohio, Oregon, and Texas). At least 3 states stated that, while supportive of the investigation of both standards and policies for Provider Directory federation through the work of the pilots, they were already on an alternative path toward a statewide Provider Directory solution, with other potential applications in addition to Direct address discovery, or even beyond HIE services (Maryland, Minnesota, and Rhode Island).



Many state HIE programs and SDEs are taking more than one approach in parallel, moving incrementally forward with better Provider Directory services with both short term and longer term strategies. A few states or SDEs were sidelined from participation in a pilot, waiting for their vendor to release a Direct software version that includes Provider Directory services.

### **Vendor Development Decisions, Market Readiness**

The Exemplar HIE Governance Program grant work plan with ONC clearly stated the goals of conducting pilots to demonstrate query and response capability of a federated set of Provider Directories, using HPDPlus standards for Direct exchange, as well as coordination with the ONC ModSpec initiative. In order to achieve those goals, the outreach conversations were intended to ascertain vendor readiness for participation in the pilots under that scenario, as well as to begin to consider the legal and policy decisions that might be necessary to be able to advance the data sharing involved in being part of a pilot. However, during the early calls with interested parties, it quickly became evident that several of the state HIE programs or SDEs were engaging in the discussion of being a pilot participant in hopes of accelerating their vendors' ability to provide the Provider Directory feature into their Direct HISP implementations. At least two of the vendors for interested states (Optum in Nebraska and Wyoming and Orion in Nevada and Alaska) did not support a Provider Directory in their Direct solutions at the time of the pilot outreach, though both stated that Provider Directory services for Direct HISPs and for broader query-HIE were scheduled on their product release timelines for late 2013 or early 2014.

Other vendors stated that they have been hesitant to move to HPDPlus while the standards are still rapidly evolving, so are continuing to provide Lightweight Directory Access Services (LDAP) and/or Directory Services Markup Languages (DSML) (CareEvolution in South Carolina, Inpriva in Illinois and Missouri, and ICA in Kansas), while waiting for the standards work to mature. All of the above vendors have expressed their support for the standards as they mature and indicated that Provider Directory development would be in the near term road map of their products.

In the above examples, some states and their vendors who have positioned cautiously on developing Provider Directories specific to Direct messaging services, are at the same time moving forward with ambitious Provider Directory development to meet market demand across multiple systems, including the health insurance exchange functions of provider networks and quality ratings, as well as the health plan and government Provider Directory needs for credentialing and payment. (Maryland, Minnesota, Arizona) However, the timing of vendor investment in development cycles to add Provider Directory services to the HISP or HIE products has put many of the state or regional HIEs and HISPs in a quandary. While nearly everyone working in health care acknowledges the need for more robust, multi-system Provider Directories and identity management systems, the state HIEs, SDEs and RHIOs who are waiting for their vendors to develop Provider Directory services for their Direct and HIE implementations, are frustrated, wanting to provide a better user experience and more value to the health care providers using their HIE services.

Several organizations using internally developed Provider Directories reported an early willingness to develop to HPDPlus standards in the timeframe of the grant (MedAllies testing for NYeC, Michigan Health Information Network (MIHIN), Regional Alliance for Information Networking (RAIN), Sujansky & Associates for a California Health Care Foundation pilot, and Surescripts). Many other HISPs and RHIOs using Mirth implementations (the Western New York RHIO HEALTHeLINK, and California's Orange County Partnership RHIO, North Coast HIN, Santa Cruz HIE and San Diego Health Connect) were excited to use HPDPlus standards to participate in a pilot. Utah Health Information Network using Secure Exchange Solutions (SES) also agreed to step up development of the HPDPlus Provider Directory within the timeframe of the grant.

As the project evolved, it came to light that the variations of HPDPlus standards were bringing additional confusion and difficulty to the development for interoperability. More detail on that is provided in [Standards](#).

None of the vendors interviewed as part of the outreach had developed a timeline for testing the ModSpec standards; many of them had limited knowledge of what ModSpec was working on or what would be needed to implement and test those standards. Through the collaborative process employed by IWG and ONC, it was broadly agreed that several additional steps for formal adoption of the standards through a standards body such as IHE USA (Integrating the Healthcare Enterprise)<sup>10</sup> would likely be necessary before any vendors would make an investment in developing to the new ModSpec standards, which were released on July 12, 2013. The coordinating conversations that emerged during this project helped to accelerate the need to define the path for moving forward with the ModSpec standards. See [Component 4: Serve as an Information Conduit to Help Inform and Involve Vendors in the Next Iteration of Standards Development](#).

### **Decisions on Pilot Participants**

Based on the assessment of the variations in readiness across the country, a decision was made in late July 2013 that IWG would only support pilots that were testing either or both HPDPlus and ModSpec, but not any other models such as directory aggregation using CSV files. This decision was made to adhere closely to the original scope of the Exemplar HIE Governance Program grant details, to ensure that the goals and requirements of the grant could be met.

A suggestion was made by Missouri Health Connection to use LDAP to connect directories with Kansas HIN, without using the HPDPlus standards. The IWG team acknowledged the value in accelerating the use of Direct by leveraging existing Provider Directories developed in standards such as LDAP, but again, the decision to stay true to the original scope of the ONC-approved work plan for the grant was made.

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<sup>10</sup> <http://www.iheusa.org/certification.aspx>

By the end of the summer, there were four pilot teams, using the services of seven vendors who chose to develop and test federated Provider Directory services as part of the IWG Exemplar HIE Governance Program grant. During the July monthly webinar, three pilots were announced with plans to test federated Provider Directory functionality, either through HPDPlus, or with the addition of ModSpec standards, before the end of 2013. Those were:

- New York – with NYeC and the Western New York RHIO, HEALTHeLINK
- California – multiple HISPs and HIOs connected by a federated directory hub, coordinated through the CHeQ Program at The Institute of Population Health Improvement, UC Davis (see page 17 for list)
- Snowbird Pilot with Florida Health Information Exchange (FL-HIE), the Michigan Health Information Network Shared Services (MiHIN), and Surescripts

In August 2013 a fourth pilot was added when NATE joined the list with the goal of onboarding Utah Health Information Network (UHIN) to the existing NATE Trust Community<sup>11</sup>, and testing the Provider Directory federation. Please see [Pilot Participants and Approaches](#) for more information about the pilots, and [Appendix 2: Outreach chart](#) for details on outreach conversations and why organizations were not able to participate in the pilots.

## Components of Project

There were five components of the IWG's Exemplar HIE Governance Program Grant project.

### **Component 1: Monitor and Support Pilots with Facilitation and Technical Support**

The primary objective of the IWG Exemplar HIE Governance Program grant was to recruit and support several pilot environments for testing the creation of federated access to Provider Directory information for the purpose of HIE across unaffiliated organizations. The four pilots, which emerged from the dozens of conversations across the country, were asked to be fairly independent in their work, but were also provided support with facilitation and technical expertise from the IWG's team of contractors, wherever necessary.

In late July and early August 2013, project plans were developed and a schedule of bi-weekly calls was set up with each pilot to ensure that progress and challenges were being closely tracked, and that additional project support could be provided when needed. One example of additional support provided to pilot participants was a crosswalk of the various HPD standards, including the ModSpec standard (see [Appendix 4: Standards crosswalk from Stella Technology](#)). This need reiterated the importance of regular check-ins with the pilots.

The pilots worked independently on their own model for Provider Directory federation, but were also connected through the introductions and facilitated conversations with each other. This structure provided a value of relationship building, problem solving, and collaboration.

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<sup>11</sup> <http://nate-trust.org/work-products/>

The importance of providing the project management and technical support through this project was apparent in a number of the pilots. While it has been noted that the work in California had started prior to the launch of this project, the infrastructure support to facilitate and provide some technical resources, accelerated conversations between unaffiliated entities, and advanced the time frame for this type of Provider Directory work, particularly in the NATE and Snowbird pilots.

## **Component 2: Provide a Broad National “Community of Practice” Value by Sharing Pilot Progress Through Monthly Webinars**

As a result of the extensive outreach efforts prior to the launch of the pilots, significant awareness was established about the work of the IWG Exemplar HIE Governance Program grant on Provider Directories. Many of the State HIE programs and SDEs, as well as a number of vendors who had originally considered being a participant, but weren't involved in a pilot, attended the monthly “come one and all” webinar/conference calls to learn more about the pilots and their progress. Over the course of the pilot period, participation on the monthly calls averaged over 60 individuals participating each month. The full list of interested parties on the contact list totaled over 150 individuals from approximately 50 organizations.

Beginning in August 2013, each monthly webinar/call featured one of the pilots providing a detailed overview of their technical and operational structure, while the other three of the pilots would provide a brief update on their progress. Because the California pilot had already begun their planning at the launch of the IWG Exemplar HIE project, Rim Cothren, representing the CHeQ Program at the Institute for Population Health Improvement, UC Davis, was able to provide a detailed overview of the California pilot on the June kick-off webinar. During the August, September and October calls, each of the other pilots took a turn providing a more detailed overview of their pilot beginning with the Snowbird pilot in August, the New York pilot in September, and the NATE pilot in October.

One of the unforeseen benefits of these monthly calls was the opportunity for the ModSpec team and other ONC representatives to answer questions and provide updates to the IWG's community of practice participants. This was particularly helpful around some of the questions on the ModSpec standards. The monthly calls also provided an opportunity for an open dialogue about emerging issues, which participants actively embraced and used as a place to raise questions and identify new connections across the country, as resources and potential partners, for solving problems in the Provider Directory topic area.

### **Component 3: Maintain Coordination with Other ONC-Sponsored HIE Governance Initiatives to Help Advance the ONC Governance Framework**

The previous work of NYeC staff and contractors in other ONC-sponsored and industry sector governance initiatives enabled the IWG to leverage experience and relationships to help identify opportunities for ONC and the Exemplar HIE Governance Program grantees to maintain strong coordination across various HIE governance initiatives at the federal and state levels.

The importance of coordination with the ONC ModSpec team has been covered in other parts of this report, and one of the key learnings of this project is the importance of aligning and communicating consistently about standards to avoid confusion in the vendor community.

From the beginning of this project, it was apparent that coordination with DirectTrust as a fellow Exemplar grantee was very important. Regular conversations occurred during the project with Dr. David Kibbe, President and CEO of DirectTrust, to help ensure coordination between the two Exemplar grant projects as well as the overall objectives of both organizations.

### **Component 4: Serve as an Information Conduit to Help Inform and Involve Vendors in the Next Iteration of Standards Development**

Coordination with the ModSpec Initiative was a critical component of this project from the very beginning. As the confusion within the vendor community about the various Provider Directory standards became apparent during the outreach segment of this project, that coordination became even more important. Rim Cothren, John Donnelly and Nagesh Bashyam, all part of the contractor's team of SMEs, have worked closely with the ModSpec team at ONC through their development process. Donnelly worked collaboratively with all parties to develop a process to move the ModSpec standards through the IHE process for standards approval. In January 2014, the ModSpec HPD standard was tested as part of the New Directions track at the IHE USA Conference and Connectathon. Five vendors participated in this testing; CareEvolution, Inpriva, NextGate, Orion Health, and SureScripts.

In addition, throughout the course of the pilots, there were regular updates on the pilots, including preliminary lessons learned and emerging issues, presented to the full IWG meetings. At the September IWG full workgroup meeting, and in a separate webinar for all of the pilot teams, Lin Wan of Stella Technology, subject matter expert (SME) consultant to IWG, presented a crosswalk of all the current Provider Directory standards (see [Appendix 4: Standards crosswalk from Stella Technology](#)). The goal of those sessions were to get the word out into the vendor community as broadly as possible, as quickly as possible, to help minimize confusion about Provider Directory standards and raise awareness about the importance of careful planning to align with the next iteration of standards emerging from the ModSpec initiative.

## **Component 5: Provide Ongoing Feedback on Exemplar HIE grant to ONC**

Bi-weekly calls were initially held with Kory Mertz, ONC Challenge Grant Director, to provide regular updates during the early months of the project. These calls then shifted to a monthly schedule after the pilots were launched. Monthly written reports have been provided to ONC, recapping the activities of the prior month throughout the project. Baseline and initial metrics were provided during the pilot period, and additional metrics for Q4 2013 and Q1 2014 have been gathered and provided to ONC. This document is the final report gathering all the information and lessons learned during the projects.

In addition, an appendix to the IWG document “Statewide Send and Receive Patient Record Exchange, Technical Specification Appendix, HPDPlus Implementation Guide” (IWG Implementation Guide) has been compiled based on the feedback from the pilot experiences (see [Appendix 6: IWG Statewide Send and Receive Patient Record Exchange Technical Specification Appendix, HPDPlus Implementation Guide Version 1.1.1](#)).

## **Pilots**

### **Basic Structure of Pilots**

Bi-weekly check-in calls were held with each of the pilot teams, and monthly webinars were held with all of the pilot participants engaged in presenting progress toward implementing the federated directory query functionality, identifying challenges, potential solutions for those challenges, and best practices. An individual project work plan was developed in collaboration with each pilot team. The possibility of drafting a common Memorandum of Understanding (MOU) was discussed, but each pilot decided to handle its own legal documents. See the Lessons Learned section for more information on agreements.

During the month of August 2013, the pilots began the substantive work to prepare for “go-live” dates in the fall. In-depth technical conversations were held within each pilot group, and the detailed project plans were finalized as decisions were made about the paths each pilot decided to pursue. Baseline metrics were collected for August, and all pilot participants reviewed the metrics template and prepared to provide quarterly reports. Regular check-in calls held from August through December, with the final calls being used to review the Pilot Feedback Forms filled out by each pilot (see [Appendix 5: Final reports from participants](#)).

October was the month where tradeoffs for prioritization of resources within some organizations slowed the progress of some pilots. Considerable time was spent by three of the four pilots on the finalization of policy documents and the development of legal agreements between participants, with some differences emerging in the way each pilot managed the trust between participants. The artifacts of policy and procedure development and/or contract development, and the lessons learned from any downstream impacts of new policies for participating HISPs and their end users are a

valuable resources from this project (in addition to the technical findings). See [Lessons Learned](#) section for more details.

## Pilot Participants and Approaches

### Snowbird Pilot

The Snowbird pilot was focused on northern and southern states that share residents who receive care in each state for part of year. Today the patient is often responsible for assuring that data is shared between providers in different states by carrying paper files back and forth. This pilot was set up to have two phases; only the second phase met the criteria of this Exemplar HIE grant project.

Phase one of the Snowbird pilot involved the sharing of Provider Directory information between Florida Health Information Exchange (FLHIE), Michigan Health Information Network (MIHIN), and Surescripts through the exchange of spreadsheets with the provider data held by each organization. Although phase one work did not meet the pilot criteria, the establishment of the relationship between MIHIN and Surescripts during phase one ultimately led to the legal agreement between those organizations and allowed development work to move toward a federated environment of the MIHIN and Surescripts directories. FLHIE chose not to continue into phase two because of the time and cost to upgrade their Provider Directory to HPDPlus 1.1 standards by the FLHIE vendor, Harris Corporation.

On December 16, 2013, phase two of this pilot was successfully tested, with a query from MIHIN to the Surescripts Provider Directory, and a corresponding response from Surescripts delivered back to MIHIN by way of the DSML 2.0 Gateway. Both MIHIN and Surescripts have stated that they are committed to continuing to work on this effort going forward past the initial pilot timeframe.

Pilot Participant	IT Solution/ Vendor	Provider Directory Standards Encountered during Pilot
Florida Health Information Exchange (FLHIE) *	Harris	IWG HPDPlus 1.0 IWG HPDPlus 1.1 DSML 2.0 Gateway
Michigan Health Information Network (MiHIN)	MiHIN	PD ModSpec with translation to a RESTful Exchange (explored)
Surescripts	Surescripts	

\* Florida Health Information Exchange was not able to complete the pilot activities.



## California Pilot

As part of California's strategy for advancing HIE across their vast state, the California Office of Health Information Integrity (CalOHII) provided funding to establish the California Health eQuality (CHeQ) program within the Institute for Population Health Improvement (IPHI) at the University of California, Davis Campus (UC Davis).

Just prior to the launch of the IWG's Exemplar HIE project, the CHeQ program launched the California Trust Framework (CTF), designed to facilitate exchange across organizational boundaries by establishing trust between organizations without the need for point-to-point data-sharing agreements. The CTF pilot<sup>12</sup> was established to inform CHeQ and the California Association of Health Information Exchanges<sup>13</sup> (CAHIE) on the policies, practices, and technologies to create and manage a trusted environment for health information exchange in California. CHeQ provided grants to eight California RHIOs and HISPs to participate in the CTF pilot where they have worked to develop the eligibility requirements for participating and the policies for a distributed network of Local Directory Services (LDS, held within each participating HISP/RHIO), with access through a State Directory Service (SDS), currently run through the CHeQ program.

The CTF pilot had two phases

- 1) Determining policies and practices necessary for on-boarding organizations to the Trust Framework
- 2) On-boarding and use of the Trust Framework to enable exchange among unaffiliated organizations

Organizations meeting the eligibility requirements defined during phase one could continue with phase two, and could participate in one or more phase two activities, which included:

- Managing trust anchor certificates for Direct
- Discovering individual and/or organizational Direct addresses using Provider Directories
- Managing certificates for gateways, implementing Healthway<sup>14</sup> specifications for query HIE
- Discovering service endpoints for Exchange services
- Discovering endpoints for Exchange services using Provider Directories

While the scope of the California CTF pilot was much broader than the IWG Exemplar HIE pilot project, the timeline for both phases of the California pilot dovetailed perfectly with the IWG's project timeline. The policy and technical findings of the California pilot related to discovering individual and/or organizational Direct addresses using Provider Directories are the portion of the CTF pilot described in this report.

As a requirement of the CTF pilot policies established in phase one, all participants that successfully completed on-boarding to the pilot were required to use "live data" representing real providers using the Direct implementations of their organization.

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<sup>12</sup> <http://cheq.wikispaces.com/Trust+Framework>

<sup>13</sup> <http://www.ca-hie.org/>

<sup>14</sup> <http://healthwayinc.org/index.php/exchange>



All eight organizations participated in development of the consensus policies and procedures that governed exchange of personal identification information (PII) through Provider Directories in the California pilot.

The following organizations participating in the California pilot successfully on-boarded into the CHeQ- managed Direct trust bundle and the federated Provider Directory by connecting to the SDS, and exchanged live data in production environments:

- North Coast Health Information Exchange (NCHIN)
- RAIN - Live Oak Health Information Exchange and Telemedicine Network
- Orange County Partnership Regional Health Information Organization (OCPRHIO)
- San Diego Health Connect
- Santa Cruz Health Information Exchange
- CHeQ program at UC Davis Health System

Some of these organizations have not yet had their end users (providers and/or their delegate staff members) use the federated service for Direct address discovery at the time of this report, but all of those on-boarded are enabled to do so.

Two other participants in the California pilot were not able to successfully exchange data, due to different reasons. Sujansky & Associates, LLC (a California Health Care Foundation pilot implementation) did not on-board due to some conflicts between the CTF consensus policies and their current operating procedures. UC Davis Health System did not on-board due to the inability of its vendor (EPIC) to support HPD during the pilot timeframe. The CTF pilot is planning to continue beyond the end of the Exemplar HIE Governance Program Provider Directory project timeframe.

<b>Pilot Participant</b>	<b>IT Solution/ Vendor</b>	<b>Provider Directory Standards Encountered during Pilot</b>
California Health eQuality (CHeQ) program	Internally developed	IHE HPD w CP601 IWG HPDPlus 1.1
North Coast Health Information Network	Mirth	
Orange County Partnership RHIO	Mirth	
Regional Alliance for Information Networking (RAIN)	Internally developed	
San Diego Health Connect	Mirth	
Santa Cruz Health Information Exchange	Mirth	
Sujansky & Associates (California Health Care Foundation pilot) *	Internally developed	
UC Davis Health System *	Epic/ Surescripts	

\* Sujansky & Associates and UC Davis Health System were not able to complete the pilot activities.

### **National Association for Trusted Exchange (NATE)**

The National Association for Trusted Exchange (NATE), formed as a nonprofit organization after the Western States Consortium pilot completed its grant with the ONC State Health Policy Consortium, has relied on the CHeQ program (see California pilot) as the technical leadership for its growing Provider Directory federation between states. Two NATE states were already in production with federated Provider Directory access (between California HISPS/RHIOs in the California Trust Framework and CareAccord, Oregon’s statewide HISP) at the time of the launch of the Exemplar HIE Governance Program Provider Directory pilots. Oregon opted not to participate in the IWG pilot project officially, but monitored the monthly calls and ultimately upgraded their Provider Directory to the HPDPlus 1.1 in order to remain connected, as their vendor Mirth also made those upgrades within their customers participating in the California pilots.

The NATE pilot for the IWG Exemplar HIE project focused on the onboarding of Utah Health Information Network (UHIN) to the NATE trust bundle with the participation of UHIN’s vendor Secure Exchange Solutions (SES), and establishing the interoperability between the SES directory services used by UHIN with other participants in the NATE federated directory. The policy documents necessary to onboard UHIN into the NATE trust bundle were signed, so that the interstate HISP-to-HISP connection has been established.

However, while much testing occurred between SES, Mirth and CHeQ, the NATE pilot was not able to move UHIN into the NATE directory production environment within the timeframe of the project,

due to the variability of the standards being used by the three organizations. UHIN is committed to continuing to work through the issues and try to move into production in the federated NATE Provider Directory as soon as possible.

During the timeframe of the pilot, several of the California pilot participants went through the NATE onboarding process, as Mirth standardized its directory for those customers as well as for CareAccord in Oregon, to the HPDPlus 1.1 standards.

<b>Pilot Participant</b>	<b>IT Solution/ Vendor</b>	<b>Provider Directory Standards Encountered during Pilot</b>
Utah Health Information Network (UHIN)	Secure Exchange Solutions (SES)	IHE HPD w CP601 IWG HPDPlus 1.1
North Coast Health Information Network	Mirth	
Santa Cruz Health Information Exchange	Mirth	

### **New York Pilot**

New York is a large diverse state of 19.6 million people. The healthcare system is highly fragmented with 240 hospitals, 800 pharmacies, 1100 imaging centers, nearly 1000 labs, 65,000 licensed doctors with 18,000 in single doctor practices and over 150 EHR vendors with multiple products and versions implemented in the state. The Statewide Health Information Network of New York (SHIN-NY) is a network that connects the existing 10 community health information exchanges in New York State. It is the largest health information exchange in the country and it currently connects 80% of hospitals in New York State and a growing number of other providers are connecting to the network.

Direct services are offered in various settings across the state, both at the individual regional health information organization (RHIO) level as well as statewide. The New York eHealth Collaborative (NYeC) offers the statewide Direct service and HEALTHeLINK, the Western New York RHIO is one RHIO that offers a regionally-focused Direct service. NYeC's vendor for Direct is MedAllies and HEALTHeLINK's vendor is Mirth. The New York pilot set out to demonstrate the use of federated Provider Directories with the use case of a provider in one region (Western NY) querying for a provider in another part of the state (NYeC).

The NYeC/MedAllies Direct model is predicated on using Direct through EHR implementations with XDR capabilities. Given the status of the NYeC/MedAllies implementation of their Provider Directory during the pilot timeframe, due to the limited availability of Direct-enabled EHRs, the New York pilot remained in a test environment for the duration of the project. However, MedAllies and Mirth were both able to successfully query the test environments of the other vendor's Provider Directory, searching by physician name, city, and specialty. In complying with IWG standards,

HPDPlus1.0 was piloted during this testing period. Using the MirthMail Test Environment and the MedAllies Test Portal through a web interface, MedAllies and Mirth were able to query multiple HPDPlus test directories. The query results displayed physician name, location and specialty, as well as the source from which this information was extracted: MirthMail and MedAllies National.

During the course of the pilot, Mirth and MedAllies noted that to enable federated searches, HPDPlus directories would need to be both discoverable and accessible. The teams also noted that current implementations of HPDPlus directories do not exercise “referrals” (i.e. “also, search HPD#2”) or “chaining” (i.e. “this HPD will search also search HPD#2 and return results”). Mirth and MedAllies both noted that guidance on security, technology standards, and acceptable policies across the states would be required to make the potential for federation of directories viable in the future.

<b>Pilot Participant</b>	<b>IT Solution/ Vendor</b>	<b>Provider Directory Standards Encountered during Pilot</b>
New York eHealth Collaborative (NYeC)	MedAllies	IWG HPDPlus 1.0
Western New York RHIO, HEALTHeLINK	Mirth	

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## Lessons Learned

### Technical Lessons Learned

#### Overview

As described in the Outreach section of this report, the Provider Directory landscape within Direct implementations is in its infancy and the widespread adoption of the Provider Directory specifications is still developing. During the outreach conversations at the beginning of the Exemplar HIE Governance Program grant activities, it was discovered that most of the Provider Directory solutions in Direct implementations were homegrown and/or based on native technology solutions such as LDAP or relational tables and therefore were not following a standard data model or standard interfaces that allowed interoperability. Therefore, some of the potential pilot participants were not able to participate in these pilots because they didn't meet the criteria for this project (see [Appendix 1: Initial outreach documents and criteria](#)). However, four geographically diverse pilots were identified to provide feedback on the Provider Directory standards based on their current implementation and capabilities to execute the pilot within the identified timeframe. The identified pilot participants had implemented a mixture of the following available HPD standards:

- IHE HPD
- IHE HPD with CP-601
- IWG HPDPlus 1.0
- IWG HPDPlus 1.1

Given the range of standards involved, one of the initial challenges confronting each pilot was to define a game plan for addressing the different technical and operational nuances of these different specifications.

Although included within the scope of the Exemplar HIE Governance Program work plan with the IWG, inclusion of an actual EHR “edge system” as part of pilots was not accomplished. While both NYeC, with their vendor MedAllies, and the UC Davis Health System’s Epic/Surescript HISP in the California pilot, made significant efforts, the short duration of the pilots and some legal/contractual barriers prevented a successful outcome with integration to an EHR system. It should be noted that the EHR vendor NextGen also expressed strong interest in the project, and attended the monthly webinars to stay up to date on the pilots.

The lack of EHR involvement in the pilot program also resulted in limited engagement of providers in this program; this was a technically oriented project, primarily. There may be a few providers using the federated directories between NCHIN in the California pilot, and CareAccord, the statewide HISP in Oregon, as access has been available in the production environments of those organizations since early 2013. With the onboarding of UHIN and additional California HISPs/RHIOs into the NATE trust community, with the California HISPs and HIOs now in live production through the CHeQ program, and if MIHIN and Surescripts move their successful tests to a production environment, more providers will be seeing federated Provider Directory access.

## Standards

As emphatically confirmed by the pilot participants, the multitude of HPD standards and implementation guides published over the past couple of years has resulted in an incompatible set of Provider Directory deployments across the country.

In addition to the confusion over the HPD standards, there was also the lesson learned that the use of different provider specialty nomenclatures in different Provider Directories could affect interoperability between directories. For example, it was discovered that some implementations in the California and NATE pilots were using the National Uniform Claim Committee (NUCC)<sup>15</sup> codes for specialties, while others were using the International Organization for Standardization (ISO)<sup>16</sup> standards for their specialty listings. The Snowbird pilot also issued concerns about future problems with the data fields for specialty or provider type in Provider Directories, citing the fact that many providers have credentials in multiple specialties and the vagueness of the field without a code could end up being a problem in a directory search. Other feedback from pilot participants suggests that more consistency in data definitions and specificity of data fields would improve the implementation guides, as those are updated.

Some pilot participants also shared concerns about using DSML standards when directories are federated between organizations. Both the Snowbird and NATE pilots discovered that complex queries using existing DSML-based Provider Directory standards require multiple queries to be issued to get the desired results and could have scalability issues at a large scale.

In August and September 2013, in-depth technical conversations continued to be held within each pilot group, with an extra call between the technical teams of all of the pilots to provide further clarity about the differences between the versions of HPD standards. Lin Wan, of Stella Technology presented slides (see [Appendix 4: Standards crosswalk from Stella Technology](#)) that cross-walked the standards, and there was strong appreciation expressed from the participating vendors. Additional discussion took place when a summary of the standards matrix was presented during the full workgroup meeting of the IWG on the September monthly call.

Finally, since the scope of all of the published implementation guides for Provider Directories did not include federation, nor any guidance regarding harmonization across an environment involving multiple Provider Directories, the communities attempting to accomplish this, including the pilots in this project, were faced with having to create a “custom” solution based on the Provider Directory deployments encountered.

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<sup>15</sup> <http://www.nucc.org/>

<sup>16</sup> [http://www.iso.org/iso/iso\\_catalogue/catalogue\\_ics/catalogue\\_detail\\_ics.htm?ics1=35&ics2=240&ics3=80&csnumber=44216](http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?ics1=35&ics2=240&ics3=80&csnumber=44216)

## Accomplishments

The Exemplar HIE Governance Entities Program was developed by ONC to support and advance the efforts of existing governance entities to benefit consumers and providers by allowing health information to flow securely between unaffiliated healthcare organizations. The IWG's work through the Exemplar grant is advancing ONC's goal by improving the interoperability of HISPs and HIOs through the federation of their Provider Directories.

When the Direct Project was launched in 2010, the goal was straightforward; a simple, secure, scalable, standards-based way for participants to send authenticated, encrypted health information directly to known, trusted recipients over the Internet. As HISPs were formed, and HIOs began to add Direct messaging to their suite of services, the value of a searchable database of approved Direct users within each HISP or HIO quickly became clear and many vendors began to implement Provider Directories, using a variety of standards. Connecting these directories in user-friendly ways, while still maintaining the data at the original source, is one emerging approach, and the IWG pilots allowed for the exploration of both technical and policy needs to create this new level of interoperability.

The IWG's facilitation of conversations about the nuances in the technical standards being used in various Provider Directory implementations, and serving as a conduit to the work of the ModSpec project helped to advance a collaboration between IHE USA and the ModSpec project, in order to map the course for the next stage of interoperability of Provider Directories. IHE USA included testing of the ModSpec standards in the 2014 Connectathon, which took place on January 27-30, 2014, and included the following vendors: CareEvolution, Impriva, NextGate, Orion Health, and SureScripts.

The IWG's Implementation Guide Appendix for HPDPlus has been updated to version 1.1.1 with the findings of the pilots; they have also been incorporated into the Provider Directory testing requirements for the HIE Certified® Direct test tools under development by the IWG for launch in the second quarter of 2014. All of these accomplishments were substantially accelerated by the work of the participating pilots of the Exemplar HIE Entities Governance Program, led by the IWG team.

## Suggested Improvements and Tools

The experiences of the pilot participants led them to suggest the following improvements and tools to help support the widespread adoption of federated Provider Directories across Direct implementations.

### Improvements to Specifications and Implementation Guides

- Issuance of a single HPD specification and an associated implementation guide with examples of appropriate Web Service Definition Languages (WSDLs).
- Develop a minimum data set that HISP's shall populate into their Provider Directories. Direct users need to be able to select with certainty the unique individual they are sending data to, so including phone numbers, street addresses for the practice, and specialties, at a minimum is critical.

- Development of reference implementation for the definitive standard and associated test suite(s).
- Development of a robust glossary of terms and applicable value sets.
- Provide a solution for supporting multi-parameter/multi-object use cases more efficiently (ex: Find Organizations for Unique Provider).
- Better guidance on security, technology standards, and acceptable interoperability policies across state lines.

### **Improvements to Tools or Services**

- Provide or ensure the availability in the industry of an automated acceptance test suite that is able to issue a set of well-defined queries and verify the responses against a canonical provider database. If possible, allow the test utility to support a sequence of releases of the standard to allow for incremental adoption by the vendors and organizations supporting federated Provider Directory communities. It should be noted, that as part of the IWG testing and certification program, the IWG Testing Tool is intended to assist in meeting these objectives and has the potential to permit parallel testing paths against different versions of specs.
- Define a higher-level query Application Programming Interface (API) –which could scale better when transmitted over networks. This is similar to the IHE Stored Queries<sup>17</sup> that operate on registries and repositories. This will provide a more scalable solution across wider implementations.

### **Use Cases**

The primary use cases for the California and NATE pilots were for discovery of Direct addresses for referrals or other transitions of care. Directories, whether for test or production, were queried on provider name, address, and specialties.

In the New York pilot, the participating vendors queried each other's Provider Directories in a test environment searching by physician name, city, and specialty.

The Snowbird pilot, because of the limited timeframe of the pilot was restricted to a test query by MIHIN and response from Surescripts on provider demographic information.

### **Legal and Policy**

At the beginning of the project, an offer was extended to help facilitate the development of legal agreements that could be used by all the pilots. California and NATE already had processes in place that had been funded through other ONC projects to develop and implement policies and agreements. The NY pilot decided that they would not need to execute a legal agreement for the exchange of test data. Surescripts and MIHIN added an addendum to an existing HISP-to-HISP agreement, which was signed to allow provider directory access for the Snowbird pilot.

In the case of the California and NATE pilots, there is a more extensive policy framework and onboarding process that has been developed outside these pilots, in the absence of a national

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<sup>17</sup> [http://www.ihe.net/uploadedFiles/Documents/ITI/IHE\\_ITI\\_TF\\_Vol2a.pdf](http://www.ihe.net/uploadedFiles/Documents/ITI/IHE_ITI_TF_Vol2a.pdf) Section 3.18



regulatory framework of policies and standards for identity assurance and certificate policies in the use of Direct for exchanging personally identified health data. Members of NATE have also grappled with interstate exchange policies, when dealing with differing state laws on patient consent for data sharing. Participants in the California and NATE pilots needed to go through the full onboarding process to be full participants. In at least one case, a potential participant had concerns about some of the policies, and it wasn't possible to resolve these policy differences within the pilot program timeframe. Documentation of the California onboarding requirements for participation in the their state federation pilot is included in [Appendix 7](#) of this report, and full documentation of the NATE Policies and Procedures can be found here. Since the completion of the pilots, additional governance arrangements are underway in California and updated policies and procedures are being developed<sup>18</sup>.

## Metrics

Proposed metrics to be tracked as part of this project were developed and approved by ONC. In August, pilots were asked to supply baseline information for the following metrics:

- # of Organizations in Directory
- # of Individuals in Directory
- # of Queries of Another HISP's Directory
- # of Successful Searches
- # of Errors when a HISP is not able to reach the destination directory
- Total # of Direct Messages Exchanged between HISPs

Pilots reported on these metrics in October 2013, December 2013, and made a final submission in mid-March 2014. It is worth noting, that in California CHEQ ceased its orchestration activities in January; due to the end of grant funding from the State of California, and responsibilities for ongoing support for the federated access to California HIO/HISP directories was again under discussion and therefore a few of the California pilot participants were either not responsive to the request for metrics or able to collect metrics in March.

Due to the fact that many of the pilots were in development or testing phases, the figures in the metrics are reflective of that. We believe it is possible that there may be more rapid deployment of federated Provider Directory solutions in late 2014, given the increasing level of interest and value placed on the accessibility of provider demographic information in a digital health environment.

## Barriers to Production

With only six months from the project kick-off webinar in late June, to the collection of pilot feedback forms in early December, the Exemplar HIE Governance Program Provider Directory pilots were facing a very aggressive timetable from the beginning. The limited adoption of the HPD standards in current Provider Directory products afforded the project a small number of vendors able to even consider participation in a pilot during the timeframe of the grant. Because the work needed to harmonize the various directories had not been on the development and release calendar of the

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<sup>18</sup> <http://www.ca-hie.org/resources>

participating vendors, there was also a need for re-prioritization of work, before testing with another vendor for federation could begin. For example, Mirth, a vendor participating in three of the four pilots, found that in several instances of their Provider Directory, there was minor variability between the HPDPlus 1.0 and the HPDPlus 1.1 standards, so a product upgrade was necessary in several sites before the federation development could occur. In one instance, however, Mirth's customer HEALTHeLINK did not upgrade to the HPD1.1 version of standards, as the New York pilot was not moving forward past the testing phase, and it seemed more logical to wait for more clarity on standards before making a change.

Finalizing legal agreements and signing onboarding agreements, as mentioned earlier in this report, also took time off of the clock for the pilots to ready their products for testing, and then for production environments. In the case of the Snowbird pilot, where phase two would provide federation between the MIHIN and Surescripts Provider Directories, the timeline for testing was pushed back several times while waiting for the legal agreements to be executed, and the pilot simply ran out of time before they could move to production with their federated environment.

An additional barrier for the New York pilot to moving into a production environment was the lack of a production version of an EHR with Direct capability and a Provider Directory to partner with, within the timeframe of Exemplar HIE grant project.

A common worry expressed by vendors, pilot participants and non-participants alike, was the concern of developing products with very limited lifespans, due to the lack of clarity of where the HPD standards would be heading. The confusion of the multiple organizations publishing various standards, with unclear or incorrect implementation guides, has caused many vendors to choose to wait for more general clarity in the industry. One comment made to the IWG team was, "Tell us what standard to build to, and we can do that." This issue has been identified as the biggest barrier to broad production and adoption of Provider Directories for Direct address discovery, as well as for query HIE services, where federation of directories could deliver high benefits for better care coordination and efficiency.

### **Non-pilot Interest**

As mentioned previously there were a large number of participants on the monthly calls and webinars, and the level of interest was maintained through the project, with approximately 50 organizations participating and additional requests to be added to the distribution list coming in every week. There were about 150 individuals on the list to receive project updates at the end of the pilots. Based on feedback received it seems as though there are two key things that motivated people to participate in the monthly meetings:

1. The monthly call was a time to efficiently get up-to-date information and be able to immediately ask any questions on Provider Directory issues.
2. For some of the technical participants it was a place to have an open dialogue with peers that isn't always possible because of competitive relationships.

## **Final Collaborations**

Given the high level of interest, the IWG Provider Directory pilot team chose to add an additional all-comers call, held on March 5, 2014, to thank all of the pilot participants, share lessons learned with the broader interested community, and request final input to the draft findings from each pilot. Approximately 150 individuals who had expressed interest in this project over its lifespan were invited, and the participation in the final call continued to indicate a strong interest in the subject of this Exemplar HIE grant project.

This project provided very important lessons that were learned through the pilots to help inform the next steps in the evolution of standards to support robust exchange of information using Direct. The identification of the range of standards currently being deployed was critical in allowing the conversation to coalesce around how to efficiently move the ModSpec standards through the IHE process, with the goal of having one definitive, accepted standard.

## **IWG Role Going Forward**

Once a new federated Provider Directory specification and implementation guide is completed, including updated guidance for both the Provider Directory resource and the Provider Directory consumer “actors,” the IWG plans to revisit this topic and author an update to its Send and Receive Specification, and the associated HPDPlus Appendix, referencing it accordingly. The recently announced collaboration between IHEUSA and ONC’s Provider Directory ModSpec project appears to be the most efficient course of action to accomplish deliverables to meet this objective including the creation of the industry tools suggested by the pilots to ensure consistent HIT product development and deployment.

The relationships and connections established through these pilots can provide a foundation for sharing future information around new standards and policies. Coordination with other standards and policy development work, and particularly with DirectTrust, will remain critical for the long-term success of these efforts.

## **Appendices**

**Appendix 1: Initial outreach documents and criteria**

**Appendix 2: Outreach chart**

**Appendix 3: Slide decks from monthly calls**

**Appendix 4: Standards crosswalk from Stella Technology**

**Appendix 5: Final reports from participants**

**Appendix 6: IWG Statewide Send and Receive Patient Record Exchange Technical Specification Appendix, HPDPlus Implementation Guide Version 1.1.1**

**Appendix 7: California Onboarding Requirements for Trust Framework Pilot**