Consumer Innovation Challenge: Final Report

ONC State Health Policy Consortium Project

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Contents

Tables

Number	Page

1. EXECUTIVE SUMMARY

The Consumer Innovation Challenge (CIC) project convened representatives from the Health Information Exchange (HIE) cooperative agreement programs in Georgia, Indiana, Montana, and Nebraska to collaborate on ground-breaking approaches to consumer engagement via health IT. Specifically, the challenge asked each state to execute innovative approaches to sharing electronic health information with consumers and enable consumer-mediated exchange through which patients can aggregate, use, and share their own electronic health information. Projects officially kicked off at an in-person meeting in March 2012 and included:

- **Georgia: Chatham Connect with Direct**. ChathamHealthLink (CHL), a project of the Chatham County Safety Net Planning Council (CCSNPC), is a Service Area HIE in Southeast Georgia, developed to serve the needs of the significant population of indigent and uninsured patients who seek care in five clinics (two Federally Qualified Health Centers and three Volunteers-in-Medicine clinics) and two hospital systems in Chatham County. For the Consumer Innovation Challenge, CHL aimed to develop Chatham Connect with Direct, leveraging the Georgia HIE Direct Project, to build a single, central patient record with normalized laboratory results from diverse sources and make them accessible to patients using a patient portal or PHR.

- **Indiana—MyVaxIndiana**. The Indiana State Department of Health (ISDH) maintains CHIRP (Children and Hoosier's Immunization Registry Program), an immunization information system that collects, forecasts, manages, and shares vaccine data with registered medical providers in Indiana. As an update to the existing CHIRP program, ISDH created the MyVaxIndiana Immunization Portal, which enables health care providers and other designees to access to vaccine records from any computer.

- **Montana—Aggregated Data for a Consumer Health Management Platform**. This project aimed to conduct a pilot project combining Employee Benefit Management Services (EBMS) claims data with the HealthShare Montana (the state HIE) clinical data for the City of Billings employee group using the Dossia Health Management Platform. The primary objective was to establish a portal that employees could use to obtain, view, and manage their health information pulled from both the EBMS claims data set and clinical information provided to HealthShare Montana.

- **Nebraska—NeHII and SimplyWell Blue Button.** Nebraska Health Information Initiative (NeHII) partnered with SimplyWell, an outcomes-based population health and wellness management program that works with self-insured employers and health care providers. SimplyWell developed Blue Button functionality to expand its PHR capabilities, which allowed consumers to download their own clinical health information from NeHII and use this data to further self-management.

This report provides additional information about the implementation and approach, dissemination strategy, and future plans for each of the CIC projects. In addition, a checklist of Best Practices for Planning Consumer Engagement Initiatives is provided to help guide future projects related to consumer access to information and consumer-mediated

exchange. The CIC projects highlight the value gained by the consumer and the effect that access to integrated data sources may have on the sustainability of HIE programs.

2. INTRODUCTION

In March 2012, the Office of the National Coordinator for Health IT (ONC) launched the Consumer Innovation Challenge (CIC). Its purpose was to collaborate with a vanguard group of state health information exchange (HIE) grantees interested in enabling consumers to be partners in their care. They were asked to implement innovative approaches to sharing electronic health information with consumers and enable consumer-mediated exchange through which patients can aggregate, use, and share their own information. ONC's goals for this challenge included spurring innovation and action as well as helping states implement their consumer-targeted initiatives by providing best practices and technical assistance to ensure success. States participating in this challenge included Georgia, Indiana, Montana, and Nebraska.[1]

This challenge aligns with ONC's Consumer e-Health Program launched in September 2011. The program focuses on empowering individuals to improve their health and health care through health IT. The strategic approach includes three main objectives to achieve its goals: Access, Action, and Attitudes. The first objective strives to give consumers *secure, timely electronic access to their health information*. The second objective is to enable consumers to take action, by supporting the development of tools and services that help make electronic health information useful *and meaningful for them*. The third objective is to shift attitudes *to have consumers and providers think and act as partners in their care* with the support of e-health tools. With these objectives, ONC aims to support consumer engagement in health care through health IT and HIE.[2]

ONC also supports consumer engagement by promoting the national Blue Button Initiative (in which ONC is supporting Blue Button's widespread adoption and use). Through Blue Button patients are able to better access to their personal health information in a downloadable format, including current medications, drug allergies, lab results, and claims and treatment data. This initiative hopes to facilitate more active participation from patients by giving them better access to their health information and further supports consumer engagement.

Engaging consumers as central stakeholders in HIE is essential because it allows patients to actively participate in making decisions with their health care providers and to manage their own health care more effectively. Studies have found that patients who are more activated

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[1] Representatives from Illinois and Maryland were also accepted as Challenge participants at the outset of the project, but had to scale back their involvement due to resource constraints.

[2] http://www.healthit.gov/policy-researchers-implementers/consumer-ehealth-program

in their own health care are more likely to receive preventive care and greater support from providers for self-management of chronic conditions, to have better clinical indicators, and are less likely to delay medical care, to have been hospitalized, or to have unmet medical needs.[3,4] Research also shows that increases in patient activation lead to positive changes in self-management behaviors such as engaging in regular exercise and taking diabetes medication as recommended.[5] In addition, achieving healthier self-management behaviors can cut health care costs as seen by the U.S. Centers for Disease Control and Prevention (CDC), which found that every dollar spent in outpatient training for diabetes self-management led to health care savings up to $8.76.[6]

Health IT plays a vital role in improving consumer engagement in health care. Tools such as electronic health records (EHRs), patient portals, personal health records (PHRs), Blue Button, and secure messaging allow patients to gain access to their health information and enhance communication with their health care providers. These health IT tools help patients to improve care coordination between multiple providers by ensuring that every provider has the most up-to-date information. This data can be especially helpful for patients when they transition between health care providers or settings and when they receive emergency care. Health IT tools can also help patients better understand their health conditions, while keeping track of their own health information such as medications, treatments, and lab results. PHRs allow patients to store their information in an easily accessible place and to refer or review their health information for accuracy any time. Keeping track of health information can help patients manage their health conditions by monitoring their chronic conditions from home, which can lead to improved health outcomes.[7,8]

Initiatives to improve consumer engagement are being driven by Meaningful Use Stage 2 requirements, which contain several objectives on consumer engagement. Moving forward, providers using electronic systems must give patients the ability to view online, download, and transmit their health information and must also use functionalities such as secure messaging with at least a portion of their patients. Such capabilities allow patients to easily

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[3] Greene J, Hibbard JH. (2011). Why Does Patient Activation Matter? An Examination of the Relationships Between Patient Activation and Health-Related Outcomes. J Gen Intern Med 27 (5):520-6.

[4] Hibbard JH, Cunningham PJ. (2008). How Engaged Are Consumers in Their Health And Health Care, and Why Does It Matter? Washington DC: Center for Studying Health System Change: 2008.

[5] Hibbard JH, Mahoney ER, Stock R, et al. (2007). Do Increases in Patient Activation Result in Improved Self-Management Behaviors? Health Serv Res: 42(4):1443-63.

[6] Centers for Disease Control and Prevention (2008). *Preventing Chronic Diseases: Investing Wisely in Health Preventing Diabetes and Its Complications*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

[7] Delbanco T, Walker J, Bell SK, et al. (2012). Inviting Patients to Read their Doctors' Notes: a Quasi-Experimental Study and a Look Ahead. Ann Intern Med 157: 461-470.

[8] Tang PC, Ash JS, Bates DW, et al. (2006). Personal Health Records: Definitions, Benefits, and Strategies for Overcoming Barriers to Adoption. J Am Med Inform Assoc 13:121–126

3

access, use, and share their health information, which, according to research, leads to improvements in overall health and long-term wellbeing.[9,10]

With current national initiatives like ONC's Consumer eHealth Program, Blue Button, and Meaningful Use, consumers are beginning to gain better access to their health information and becoming more engaged in their own health and health care. State HIE initiatives can be instrumental in identifying and implementing new ways to share health information with patients. As the leaders of health information exchange in their states, the CIC participants set out to build on previous consumer engagement initiatives and find new ways for consumers to access and share their health data to improve health outcomes.

3. IN-PERSON KICKOFF/PLANNING MEETING

To officially kick off the CIC, representatives from participating states attended an in-person meeting supported by the State Health Policy Consortium (SHPC) project. During this meeting, held in Chicago in March 2012, participants discussed various components of their planned consumer activities with the intent of optimizing and finalizing them.

The full-day meeting consisted of large group discussions and a series of state-specific breakout sessions. Each state group presented an overview of their project and received suggestions and feedback from other meeting participants. They also participated in a facilitated discussion about overcoming barriers to innovation in the health care consumer market. Each state group then took part in 45-minute breakout sessions covering the following topics: policy; infrastructure and technology; engagement; operations and metrics; and goal setting (with ONC staff). Subject matter experts in each topic area facilitated the breakout sessions (see Table 1). An assigned "buddy" followed the state team to each breakout throughout the day to ensure continuity and to capture major discussion points.

During these breakout sessions, representatives from each state team worked together to populate project work plan templates. Participants analyzed each issue, identified data sources for researching solutions, defined desired end products and outcomes, assigned responsibility for tasks, and established the schedule for completing tasks.

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[9] Zhou YY, Kanter MH, Wang JJ, et al. (2010). Improved Quality at Kaiser Permanente through E-mail between Physicians and Patients Health Affairs. 29(7): 1370-1375.
[10] Osborn CY, Satterwhite Mayberry L, Mulvaney, SA, et al. (2010). Patient Web Portals to Improve Diabetic Outcomes: A Systematic Review.

Table 1.   Consumer Innovation Challenge Subject Matter Experts/Facilitators

Breakout Sessions	Experts/Facilitators
Policy	Alice Leiter (National Partnership for Women & Families), Jeff Donnell (NoMoreClipboard), and Dave Juntgen (NoMoreClipboard)
Infrastructure	James Speros (Office of the Secretary of Veterans Affairs), John Hall (Direct Project), and Ali Emami (Microsoft)
Engagement	Brad Tritle (Health-e Republic) and Jim Hansen (Dossia Consortium)
Goal Setting	Claudia Williams (ONC) and Erica Galvez (ONC)
Operations	Brian Ahier (Mid-Columbia Medical Center), Christina Galanis (Southern Tier HealthLink), and Kenyon Crowley (University of Maryland)

Meeting participants left with detailed action plans that provided defined objectives and specific next steps in order to help participants achieve their goal of improving consumer access to health care data in their state. In addition, they established a rapport with various experts in the field who could provide guidance and troubleshooting in the months to come. Finally, participants built a team identity that provided encouragement and support during the execution of the challenge. State representatives left the meeting energized and excited to begin the work ahead.

4.   STATE-SPECIFIC PLANS AND OUTCOMES

Each state prepared a project plan as part of their application to participate in the CIC project. This section outlines each project and the outcomes that were attained during the 9-month period of performance for each project.

4.1   Georgia—Chatham Connect with Direct

4.1.1 Overview Statement and Objectives

ChathamHealthLink (CHL), a project of the Chatham County Safety Net Planning Council (CCSNPC), is a Service Area HIE in Southeast Georgia, developed to serve the needs of the significant population of indigent and uninsured patients who seek care in five clinics (two Federally Qualified Health Centers and three Volunteers-in-Medicine clinics) and two hospital systems in Chatham County. CHL follows a centralized model, with a central data repository, an enterprise master patient index, and a clinical portal.

For the CIC, CHL aimed to develop Chatham Connect with Direct, leveraging the Georgia HIE Direct Project, to build a single, central patient record with normalized laboratory results from diverse sources. The goal was to make these lab results accessible to the patient by sending it to the patient's preferred PHR solution in addition to populating the

available clinical portal, to investigate ways to increase consumer access to information while at the same time eliminating the clinician's burden to provide a patient portal. The focus of this planning project was to map the steps, resources, and policies necessary to establish PHRs for the indigent and uninsured in Chatham County, GA.

Chatham Connect with Direct uses Direct addresses as both an identification/authentication solution for patient access (the patient provides their Direct address during a face-to-face interaction with a provider) and a key identifier in matching incoming laboratory data from the lab hub to patient records in CHL. Chatham Connect with Direct has partnered with state agencies to undertake the analysis and study necessary to integrate a lab solution with the Direct project on behalf of patients.

4.1.2 Implementation and Approach

Key Partners

- The Georgia Department of Community Health
- Chatham County Safety Net Planning Council
- ChathamHealthLink
- Halfpenny Lab Hub
- Mirth Connect
- Mirth Results
- Nextgate MatchMetrix EMPI
- Georgia Health Information Service Provider (HISP) through Medicity
- Microsoft HealthVault

Technical and Policy Challenges

The main challenge CHL (and the project team) faced during the development of Chatham Connect with Direct was getting multiple vendors to cooperate in developing interfaces to connect their projects and automate the technical flow. To overcome this challenge, the project team set up weekly joint vendor meetings and worked with vendor project managers to keep track of each vendor's assigned tasks for the project. Because they appreciated the value of the project's goals and understood how integration could enhance their products, vendors made many valuable contributions during the project.

A second challenge was a lack of references to similar projects which the project team could build on to design the system to include Direct addresses in the patient demographics and Direct messaging from an HIE. The project built a team consisting of members of the project's partners, vendors, and ONC subject matter experts. Weekly team meetings enabled the resolution of difficult integration issues.

Outcomes to Date

The major outcome from Chatham Connect with Direct so far is the development and successful testing of the technical pathway. At this time, all participating vendors have attested to the processes and interfaces developed and to the function of the various steps of the system. Observation Result messages with lab results have been sent successfully through the system and display of the results has been observed in test patient PHRs in an easily readable format for patients. The project team is also producing a white paper focusing on the identification/authentication solution used for this project, which will include information on the necessary procedures and disclosure and consent policies needed to develop this solution. In addition, education modules and patient facing policies have been drafted for the Chatham Connect with Direct project and will be available soon at http://www.georgia-hie.org. Figure 1 shows the technical pathway by which Direct was used to transmit HL7 messages.

Figure 1. Lab Results Process
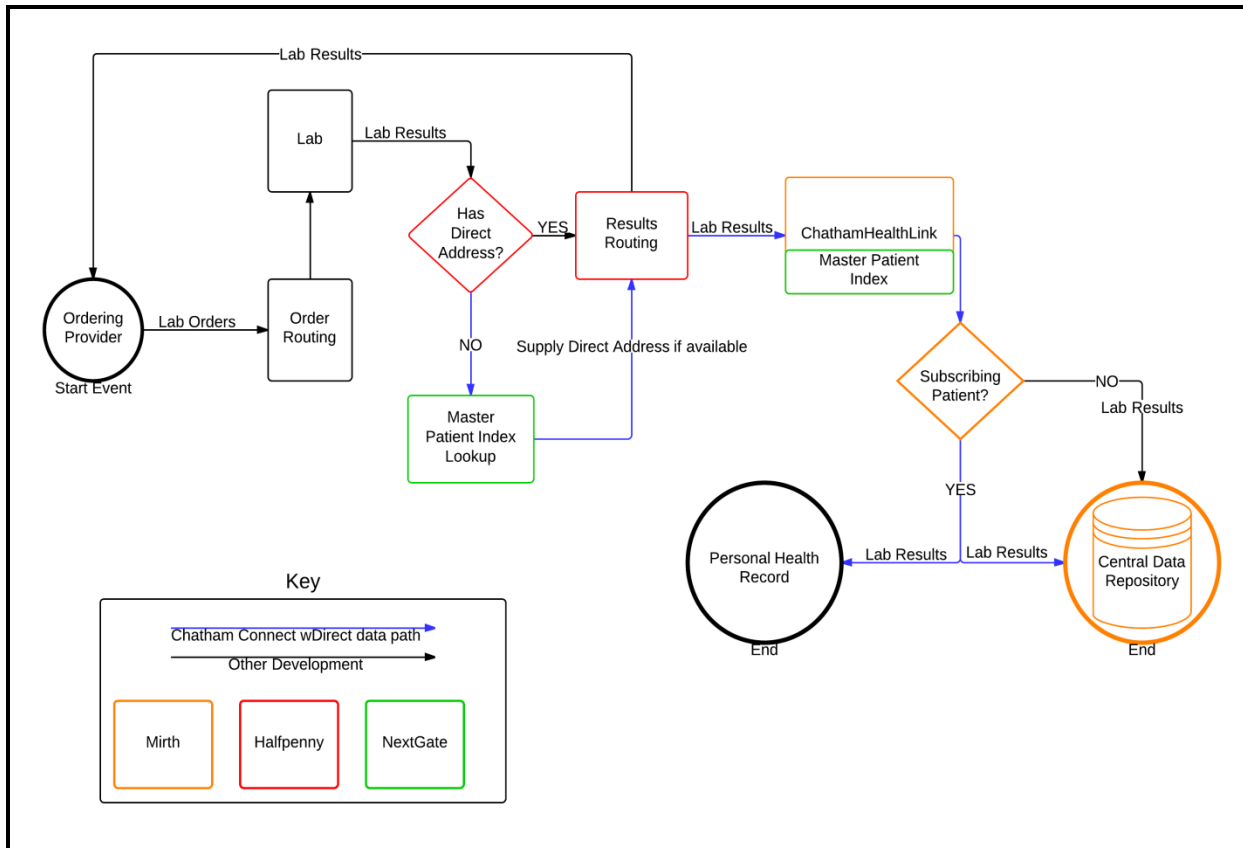
4.1.3 Dissemination Strategy to Providers and Consumers

Once the technical pathway is moved to the test environment, two volunteer patient/provider groups will test and provide user feedback to refine the system. These groups will also work with application developers at Georgia Tech University to develop applications for displaying lab results that are meaningful and usable for consumers. A community rollout event is planned for April 2013 to promote Chatham Connect with Direct to consumers in the Chatham County area.

4.1.4 Plans Moving Forward

The Chatham Connect with Direct team is cooperating with a concurrent state HIE Challenge Grant project in Rome, Georgia with similar patient-facing goals for breast cancer patients. This new project intends to implement successful aspects of the Chatham County project and, similarly, Chatham County will duplicate successful initiatives from the Rome project. Chatham County will continue to promote the use of PHRs to support the patient-centered medical homes in the Safety Net system and throughout the community. It will also offer support, materials, and information to any other Georgia community wishing to implement communication with patients through Direct messaging and PHRs.

4.2 Indiana—MyVaxIndiana

4.2.1 Overview Statement and Objectives

The Indiana State Department of Health (ISDH) maintains CHIRP (Children and Hoosier's Immunization Registry Program), an immunization information system that collects, forecasts, manages, and shares vaccine data with registered medical providers in Indiana. Providers may include private medical facilities, local health departments, hospitals, schools, and daycare centers. The program is operated under the Indiana Code 16–38–5, which allows providers and their designees to access CHIRP. As part of the CIC, Indiana developed a portal to allow access to vaccine history record for individuals or their dependents using a patient ID number (PIN) assigned by either a registered CHIRP provider or ISDH.

As an update to the existing CHIRP program, ISDH created the MyVaxIndiana Immunization Portal, which enables access to vaccine records from any computer. To begin this process, a registered CHIRP provider creates a PIN that grants a person specific patient access to the record he/she has requested. A parent or guardian can also request a PIN to view a dependent's immunization history—individuals, including minors, can do the same for their own records. The portal provides a number of options to view and save data: the ability to print and save the official immunization record, download the record into a file format compatible with the PHR, download via Blue Button, or request to have it faxed or mailed.

4.2.2 Implementation and Approach

Key Partners

- Physicians throughout the state of Indiana

- State medical associations

- School nurses

- Local health departments

- Microsoft—security code and intrusion review

Technical and Policy Challenges

The MyVaxIndiana team faced several challenges during this project; in particular, using the MyVaxIndiana program within the limits of current Indiana state laws and ISDH policies. These rules previously established the use of information in the vaccine registry as well as an individual's right to access his/her immunization history. The MyVaxIndiana portal was designed so that individuals could access their vaccination history without connecting directly to the CHIRP directory itself to abide by state laws and ISDH policies. The team also faced security challenges involving authentication of patients, parents, and guardians to access vaccination records on the MyVaxIndiana portal. To keep vaccination records private, CHIRP providers create a unique patient ID number (PIN) during a face-to-face authentication process the first time a patient, parent, or guardian wants to access the vaccination records.

Outcomes to Date

The MyVaxIndiana project achieved positive results in a short timeframe. In April 2012, the MyVaxIndiana concept was created and business rules were established for the project. In May 2012, the team developed the application for the Web-based portal of MyVaxIndiana, tested the connection to the CHIRP Repository, and performed a security code review. During June 2012, the team conducted a pilot test with 23 active CHIRP providers to test the application and gather feedback from users. After only 4 months, on July 23, 2012, the MyVaxIndiana portal was rolled out to consumers. As of November 2012, 15,262 PINs had been issued and 14,909 total records had been accessed through the MyVaxIndiana portal. Participation among both providers and consumers continues to grow each month. Consumers have begun to ask their providers to sign up for CHIRP so they may get access to their information through the MyVaxIndiana tool.

4.2.3 Dissemination Strategy to Providers and Consumers

To help promote the MyVaxIndiana portal to both providers and consumers, the team developed a dissemination strategy that included a media campaign, promotion within ISDH, and creation and distribution of promotional materials. The media campaign, which

9

began with the rollout of MyVaxIndiana on July 23, 2012 and ended August 20, 2012, consisted of half-page, full-color newspaper buys that ran statewide in major markets as well as in specialty publications such as *Indy's Child*. A 60-second radio spot also ran statewide to promote MyVaxIndiana to consumers.

To help promote MyVaxIndiana to providers, the team developed a plan to promote the portal within ISDH. During a press conference on July 23, 2012 the team presented a demonstration of the MyVaxIndiana tool to the State Health Commissioner and representatives from CDC, ONC, and the Indiana Academy of Family Physicians, among others. A July 23, 2012 news release included a quote from ONC as well as an op/ed written by the State Health Commissioner. The team also held lunch-and-learn sessions to explain and demonstrate the tool to ISDH employees. An article about MyVaxIndiana was published in *Public Health Matters*, ISDH's quarterly newsletter. The ISDH website was updated to include information and a link to the MyVaxIndiana portal, and a Web banner began running on the website on July 23, 2012. In addition, a widget was created and distributed to partners and stakeholders once MyVaxIndiana was rolled out.

Other promotional strategies targeting providers and local health departments included e-mails from the State Health Commissioner, interactive Webinars to demonstrate the tool to providers, and presentations conducted during local health departments' monthly Webcasts. Articles were also written about MyVaxIndiana for the Indiana State Medical Association newsletter, the Indiana State Hospital Association newsletter, and ISDH's monthly newsletter for health officers. School nurses were sent information about MyVaxIndiana directly from the Indiana Department of Education.

Promotional materials were created and distributed to all 94 local health departments as well as providers throughout Indiana to help publicize MyVaxIndiana. Materials included posters describing the portal that could be hung in waiting areas of health departments and provider offices, and wallet cards with the portal's URL and space to write in the patient's name and PIN number for providers to distribute to patients or guardians.

4.2.4 Plans Moving Forward

Next steps for the MyVaxIndiana project include updating the portal to be accessible on mobile phones and handheld devices. The team will develop applications for iOS devices including the iPhone and iPad as well as Google Android OS platforms so users can access their vaccination records from these mobile devices. Soon the MyVaxIndiana team plans to establish channels for sending this data directly to PHR systems for easier patient access.

4.3 Montana—Aggregated Data for a Consumer Health Management Platform

4.3.1 Overview Statement and Objectives

This project aimed to establish a pilot to combine Employee Benefit Management Services (EBMS) claims data with the HealthShare Montana (the state HIE) clinical data for the City of Billings employee group using the Dossia Health Management Platform. The primary objective was to establish a portal that employees could use to obtain, view, and manage their health information; pulling data from both EBMS' claims data set and clinical information provided to HealthShare Montana. Information provided through the Dossia platform to participating patients included items such as provider information, sites at which they had been seen, a problem list, medications, diagnoses, laboratory data, and any available cost data. To achieve the goal of a centralized health management application, the project team hoped to combine clinical and claims data into a single platform available to patients.

4.3.2 Implementation and Approach

Key Partners

- Employee Benefit Management Services (EBMS)
- Dossia
- City of Billings, MT
- Rocky Mountain Health Network
- Northwest EHR Collaborative

Technical and Policy Challenges

The team had no technical challenges with the implementation of the platform. The primary challenge was with getting practice sites to send clinical data. It has taken longer than expected to receive clinical data primarily due to regulatory barriers.

Outcomes to Date

To date, the health management platform has enrolled 1,217 registered users (patients) and has transmitted 253,568 unique medical items (documents). For multiple reasons, the project has been very successful, even in its early form. The project partners found an important aspect of their success has been due to an employer-sponsored model. In this model, employers can incentivize employees to support the uptake and use of the tool provided. EBMS was able to cut deductibles in half for those employees that signed up for the tool. Many PHR services offered by providers are not incentivized in the same manner.

4.3.3 Dissemination Strategy to Providers and Consumers

HealthShare Montana and Northwest EHR Collaborative Inc. worked closely with EBMS to implement and kick off the project. Two months prior to the event, they began to meet regularly to define specifics of the pilot kickoff event including the message to target audiences and mechanisms for distributing the messages. The event was held on September 28, 2012, at St. Vincent Healthcare in Billings and included project staff, health care leaders, public officials, members of the public, a representative from ONC, and press from Montana. Core components of the message included:

- explanations of what consumer engagement is and Montana's approach to consumer engagement;
- how consumer engagement and access to medical information will change health care;
- testimony from a patient about how Dossia would help improve patients' lives and their health care management;
- overview of Dossia capabilities; and
- a reading of support letters from Montana's senator, governor and a mayoral proclamation for Consumer Innovation Day.

The event was very successful; it generated awareness in the press, with consumers and awareness within Montana's health care system. It also generated momentum for the implementation itself and solidified the project effort including the collaborations that had been developed.

4.3.4 Plans Moving Forward

By working with Dossia to leverage the HIE as a data aggregator, Montana established a platform that patients could use as a health management toolset. The project staff sees a wide range of opportunities to build additional tools in the application based platform. Although the capability to include clinical data was not realized because of delays in implementing participation agreements with providers through the HIE, the project was able to accept data from EBMS and forward it on to Dossia, providing a valuable initial product to consumers. Project staff members also tested EMPI functions within Dossia to match patients across multiple data inputs. HealthShare Montana staff are excited about the framework of this platform and its ability for expansion throughout the state.

4.4   Nebraska—NeHII and SimplyWell Blue Button

4.4.1 Overview Statement and Objectives

Nebraska Health Information Initiative (NeHII) is a statewide HIE designed to share health data among health care providers in Nebraska and neighboring states. Through sharing clinical and administrative data to providers, NeHII aims to improve the quality of health

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12   *necessarily reflect the opinions or policies of ONC.*

care and control the rapidly increasing cost of health care while protecting the security and privacy of medical information. For the CIC, NeHII partnered with SimplyWell, a comprehensive and innovative outcomes-based population health and wellness management program working with self-insured employers and health care providers. SimplyWell provides patients and employees with information and tools to reduce health risks while promoting preventive care and healthy living.

The goal of this collaboration was to expand the PHR capabilities SimplyWell offered to its users by developing Blue Button functionality. This addition would allow consumers to download their own clinical health information from NeHII and use this data to improve self-management. This collaboration aimed to promote a healthy lifestyle and prevent major chronic diseases prevalent in the Midwest, including coronary heart disease and diabetes.

The objective of this project was to enable consumers to log onto the SimplyWell PHR site and click on a simple Blue Button to obtain their health information. This information was converted from NEHII's CCD format into Blue Button readable format. The ability for patients to access information this way is essential to support Stage 2 Meaningful Use criteria, which require that 50% of a provider's patients have access to online health information for viewing, downloading, and/or transmission within 4 business days of an encounter.

4.4.2 Implementation and Approach

Key Partners

- NeHII
- SimplyWell
- ONC
- SimplyWell's development partner—Baldwin, Hackett & Meeks, Inc.
- OptumInsight
- Infuse for NeHII consumer microsite—public relations firm for consumer awareness
- SimplyWell's marketing consultants—consumer education campaign development

Technical and Policy Challenges

NeHII faced several challenges while developing this project. Vendor programming fees were higher than expected. Also, technical requirements for this tool had to be defined and agreed to by the vendor, OptumInsight, and SimplyWell. In addition, the team worked with legal counsel to develop an agreement between NeHII and SimplyWell to manage the liability risk of identity management, which has now successfully been laid out. An assessment of potential fees versus value-add was needed to plan for financial sustainability of the project. An analysis will also be needed of the Blue Button Transform standards and

13

functional requirements to assess if any associated customizations are required. Lastly, the project team had to determine a time frame for displaying lab results that fulfilled waiting period requirements to give providers adequate time to discuss results with patients before releasing the results to the patient.

Outcomes to Date

NeHII and SimplyWell have worked with OptumInsight to identify the technical functionality requirements and refine cost estimates for programming development. NeHII has also been in contact with the U.S. Department of Veterans Affairs (VA) and the HL7 PHR Work Group about their experience and use of Blue Button and gained access to HL7's CCD-to-Blue Button Tool.

4.4.3 Dissemination Strategy to Providers and Consumers

To promote the use of the Blue Button through SimplyWell, NeHII released a consumer awareness campaign. Blue Button will also be incorporated into SimplyWell's own marketing campaign—information about Blue Button will be displayed when patients log onto SimplyWell.

4.4.4 Plans Moving Forward

NeHII will continue to explore additional opportunities to fund the development of this project including investigating various foundation possibilities. NeHII also plans to set up a meeting with appropriate ONC representatives for an update on the current state of the Blue Button Transmit standards and functional requirements, to update the tool as needed.

NeHII may also explore other partners who are willing to fund the incorporation of the Blue Button into NeHII such as NoMoreClipboard and Microsoft Healthvault.

5. BEST PRACTICES

Participants in the CIC met on a regular, usually monthly, basis to have topic-specific discussions with subject matter experts and to present their own successes and challenges. Subject matter experts presented on topics of consumer outreach, consumer value in health IT, Blue Button, and eHealth tools. Each state also presented updates on their individual projects to the group to gain feedback and advice from other states. At project close, each state was asked to provide a set of best practices drawn from their experience, which could serve to support future programs focused on providing consumers electronic access to their health information. The checklist in Table 2 identifies the practices that were most important to the various initiatives. The use of this checklist is encouraged for anyone considering, planning, or executing a project that involves consumer involvement with HIE.

Table 2.   Best Practices for Planning Consumer Initiatives Checklist

Topic Area	Best Practice Recommendation
Policy	☐ Review policies and state laws. Determine which you can leverage to drive use and which may need to be changed. ☐ When working with a new HIE partner, understand their identity management processes and identify any policy ramifications up front. ☐ Outline the process/policies unique to the proposed project for patient authentication, identity proofing, matching across systems and other privacy and security-related issues. ☐ Begin reviewing participation agreements and other legal documentation as early as possible.
Infrastructure and Technical Requirements	☐ Provide solutions that are easy for stakeholders to use and designed to take advantage of or transition from early HIE services to more advanced exchange frameworks. ☐ Get the right engineers at the table from both sides to make good progress quickly.
Patient Engagement	☐ Make access and use easy for consumers as well as their providers to increase adoption. Working with a wide range of stakeholders can produce the most successful outcomes. ☐ Consider leveraging outside partners to assist with marketing plans. ☐ Carefully consider incentives and other market opportunities that will drive adoption of the tool among consumers.
Operations and Metrics	☐ Review your operational capacity for exchange, both the current and future state. ☐ Ensure a method for evaluating the success of the project as part of the initial plan. ☐ Determine pricing model early and investigate possibility of revenue streams. Determine how revenue will be shared if partnering with a third party vendor.

15

6. CONCLUSION

The growth of electronic records and HIE has created new opportunities for consumers to take a more active role in their health care and in managing their health data. Each state participating in the CIC was strongly motivated to empower patients by providing them with new ways to access their health information. In the near future, countless opportunities will be available to leverage functionalities and build meaningful connections for consumers. The CIC projects provide a glimpse into that future as well as inspiration to encourage a continual progression toward patient-centeredness and a new thinking about taking ownership of one's own health and well-being.

6.1 What Did We Learn?

The variety of projects conducted by CIC participants reflect the variety of patient needs for access to health information and the variety of solutions being developed to provide it. Patients are not a single, monolithic group. The type of electronic health information needed, the method of access, and the frequency of that access varies from person to person and even throughout an individual's lifetime. However, the simple, unifying concept linking these projects—to increase the ability for patients to access information when and where they need it—allows us to identify some common lessons that apply to developing any initiative that aims to put patients in control of their data.

- **Patient-mediated exchange is a win-win for all stakeholders**. In Nebraska, the ability for consumers to download information via Blue Button helps providers attain Meaningful Use Stage 2 requirements. Georgia's Chatham Connect with Direct project is making laboratory results available to providers through the HIE also available to consumers, which decreases the need for providers to manage individual portals. In addition, equal access to information provides the opportunity for a partnership between consumer and provider, laying the groundwork for a more engaged patient. These applications provide incentives and benefits to a variety of stakeholders, not only to the consumer.

- **Legal and policy barriers should never be underestimated.** Both Georgia and Indiana reported struggling with issues of patient authentication. Indiana also had to create a structure that fit within the regulatory framework set out by state law when creating their application. Montana and Nebraska both spent more time than expected on the necessary legal agreements between partners. Across the board, all parties were committed to providing consumers the ability to access their health data, but the need to ensure the safety of data often determines the direction and speed of a project.

- **Use partnerships and existing resources.** Both Montana and Nebraska partnered with established products and services to create a new platform for patients to access their information. Montana's partners were able to incentivize consumers to sign up for the service, while Indiana was able to take advantage of a number of frameworks to execute their marketing and rollout strategy.

- **Successful products serve a need within the population.** The success of the MyVaxIndiana service is mostly because it recognized a need that was very specific but widespread across the population. Georgia specifically targeted the underserved population because of the increased likelihood of patients to be seen by multiple different providers and facilities within the network.

6.2 How Does This Move The Bar Forward?

The lessons learned by the CIC participants can contribute to the long-term sustainability and expansion of the HIE program. Nebraska noted that the initiative provided them with important knowledge about the types of services consumers are willing to pay for to monitor their health. Similarly, Georgia project leaders felt that patient engagement through secure and efficient communication of health data is important for both health outcomes and a sustainable business model. Using Direct secure messaging to enable communication from the HIE to patients provides a general framework on which a number of valuable services can be built to meet the needs of both consumers and their providers.

In Indiana, the MyVaxIndiana application served as a tool to encourage physicians to participate in the immunization registry system. When consumers learned they could access their immunization information any time on the Web, they asked their physicians to participate—proving that consumers have the power to drive adoption when presented with an application with value to them. Not only has consumer enthusiasm for electronic access to information grown out of MyVaxIndiana's success, it has also increased interest and momentum for building new applications supported by the HIE infrastructure. The Indiana CIC project team is discussing ways the MyVaxIndiana technical framework could be used and expanded across the state.

In Montana using an employee-based PHR rollout strategy has been a successful model for incentivizing uptake and use of the tool, even though it has not yet reached its full objective of providing claims and clinical data.

Consumers are frequently identified as the most underutilized force for change in health care. The projects conducted in the CIC highlight the ability to harness that force by creating environments in which patients can meaningfully interact with and use health information in a way made possible through the transformative and foundational power of electronic HIE to achieve the promise of a revitalized and revolutionized health care system.

17