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Promises and pitfalls of health information technology for home- and community-based services

Sangeeta C. Ahluwalia, PhD [Senior Policy Researcher],
RAND Corporation, 1776 Main Street, Santa Monica, CA 90401

Esther Friedman, PhD [Behavioral/Social Scientist],
RAND Corporation, 1776 Main Street, Santa Monica, CA 90401

Daniel Siconolfi, PhD [Behavioral/Social Scientist],
RAND Corporation, 4570 Fifth Avenue, Suite 600, Pittsburgh, PA, 15213

Debra Saliba, MD [Physician Policy Researcher],
RAND Corporation, 1776 Main Street, Santa Monica, CA 90401

Jessica Phillips, MS [Policy Analyst],
RAND Corporation, 1776 Main Street, Santa Monica, CA 90401

Regina Shih, PhD [Senior Behavioral/Social Scientist]
RAND Corporation, 1200 South Hayes Street, Arlington, VA 22202

Abstract

Background—Health information technology (HIT) use in home- and community-based services (HCBS) has been hindered by inadequate resources and incentives to support modernization. We sought to understand the ways the Medicaid Balancing Incentive Program (BIP) facilitated increased use of HIT to increase access to HCBS.

Methods—Qualitative analysis of interviews with 30 Medicaid administrators, service agency providers, and consumer advocates.

Results—Although stakeholders perceived several benefits to greater HIT use, they highlighted critical challenges to effective adoption within the LTSS system, including lack of extant expertise/knowledge about HIT, the limited reach of HIT among rural and disabled beneficiaries, burdensome procurement processes, and the ongoing resources required to maintain up-to-date HIT solutions.

Conclusion—The structural reforms required by BIP gave states an opportunity to modernize their HCBS systems through use of HIT. However, barriers to HIT adoption persist, underscoring the need for continued support as part of future rebalancing efforts.

Background

Among older adults with chronic illness, healthcare is often fragmented and poorly coordinated across providers and settings, creating medical error, increased costs, and lower

Corresponding Author : sahluwal@rand.org, 310-393-0411x7546.

quality of care (Frandsen, Joynt, Rebitzer, & Jha, 2015). Health information technology (HIT) can facilitate the exchange of health information and is integral to reducing healthcare fragmentation and increasing coordination. For example, electronic medical records' (EMRs) ability to collate, transfer, and support use of patient information across settings could improve coordination across providers and settings and reduce medical error (Hersh, 2009). HIT also has potential to support health management at home and may help older adults live independently longer (Soar & Seo, 2007).

HIT is particularly relevant for home- and community-based services (HCBS). In the United States, spending on HCBS now encompasses 57% of all Medicaid long-term services and supports (LTSS) expenditures as of fiscal year 2016 (Eiken, Sredl, Burwell, & Amos, 2018; Musumeci, Chidambaram, & Watts, 2019). This reflects consumer preferences to receive care in homes and communities over institutions, and also state efforts to meet those preferences by rebalancing care away from institutions whenever possible. Considerable variation exists in the extent and success of rebalancing efforts across states, with HCBS as a percentage of LTSS expenditures ranging from 31% (Mississippi) to 80% (Oregon) in 2015 (Eiken, Sredl, Burwell, & Woodward, 2017). Despite efforts to facilitate access to HCBS and streamline delivery, the system remains a patchwork of services, providers, and financing mechanisms. Differences in eligibility, funding mechanisms, services and benefits, and referral and application processes for HCBS programs within and across states delay access to HCBS. HIT could help to standardize the HCBS eligibility assessment process, support centralized data management and standardize data collection, while supporting care coordination and information exchange across service providers and programs (Snyder et al., 2011; Steichen & Gregg, 2015). However, HIT uptake in HCBS has been hindered by inadequate resources and incentives to support modernization, raising a critical question: to what extent might HIT facilitate timely and appropriate use of HCBS, and what are the key barriers and facilitators to doing so?

The Medicaid Balancing Incentive Program (BIP), a recent rebalancing program initially implemented between 2011 and 2015, encouraged states to increase access to non-institutional LTSS by providing enhanced federal funding for home and community-based services (HCBS). To be eligible for BIP, a state had to spend less than 50% of total Medicaid LTSS expenditures on HCBS (Balancing Incentive Program. Retrieved from https://www.medicaid.gov/medicaid/long-term-services-supports/balancing-incentive-program/balancing-incentive-program/index.html). BIP required three structural reforms to streamline assessment and eligibility through a "No Wrong Door" single entry point system, a core standardized assessment instrument (CSA) to determine eligibility, and conflict-free case management. States were also required to develop plans to use health information exchange (HIE) and HIT systems to implement, coordinate, and maintain these components through online consumer-facing platforms, state-led websites, and centralized databases, effectively making BIP a policy vehicle for explicitly encouraging HIT in HCBS.

We sought to examine the extent and ways in which states utilized HIT to support BIP implementation to understand the potential for HIT adoption within the LTSS system more generally. Findings from this analysis can provide guidance to policymakers, program

designers and providers regarding the optimal role of HIT in future efforts to improve access to and delivery of HCBS and LTSS.

Methods

Overview

As part of a mixed-methods study of BIP implementation and impact, we conducted qualitative interviews with key informants from BIP-participating states. We drew from these interviews to explore the implementation of core program components and characterize the use of HIT tools, including HIT implementation challenges, perceived benefits from using HIT, and what might be needed to sustain effective HIT in HCBS. The study was reviewed and approved by RAND Human Subjects Protection Committee (#2016–0117).

Sample

States for interviews were sampled from the 38 states (and the District of Columbia) that were eligible to participate in BIP based on FY09 HCBS expenditure as a percentage of total LTSS spending. Of the 18 states that applied and participated in BIP, HCBS spending on average for 38% of LTSS expenditures, compared to 42% in states that did not participate in BIP. From these 18 states, we purposively selected eight for study to capture geographic diversity based on Census regions and equal representation in terms of BIP adoption (i.e., early vs late adopters). Among these eight states HCBS spending in 2009 was on average 40% of LTSS expenditures. We purposively identified and invited three types of key informants within these eight states – Medicaid administrators (e.g., state Medicaid Director, BIP or HCBS Director, or other related Medicaid representative), service agency staff, including managers and direct service providers, and consumer advocates. Recruitment was initiated with a letter to state Medicaid Directors requesting permission to contact staff for an interview. Following approval, BIP Directors were contacted using either online staff directories or direct referral from the Medicaid Director. Service Providers and Consumer Advocates were identified through online professional organization directories, summaries from HCBS/LTSS program meetings hosted by the state, or direct referral from prior interviewees. All respondents were invited via email to participate in a one-hour interview and eligible respondents received $100 honoraria for participation in an interview.

Data Collection and Analyses

Hour-long telephone interviews were conducted by one interviewer and one note-taker and were audio-recorded following participant consent. We allowed more than one interviewee to participate if preferred and identified by the initially targeted respondent. For example, some interviewees requested to include a colleague who could provide additional information or a complementary perspective during the interview. All interview processes were approved by the institution’s Human Subjects Protection Committee. Semi-structured guides including questions about BIP application, implementation, and anticipated or realized impacts of BIP, with probes throughout to assess the role of HIT in BIP, was used to facilitate the interview. We tailored each guide for the key informant type; i.e., Medicaid

administrator vs service agency staff versus consumer advocate (see Appendix for sample questions).

Audio-recordings were transcribed verbatim and coded using a standardized codebook. The codebook was developed in two stages using a standard iterative and consensus-based process (Cascio, Lee, Vaudrin, & Freedman, 2019; Srivastava & Hopwood, 2009). First, we developed a hierarchical coding scheme derived from the interview guide and organized by topic area. Second, two trained qualitative researchers first independently coded five transcripts to establish agreement regarding the definition and application of individual codes and to identify subcodes arising from the interviews. The codebook was finalized following coder and team consensus. Subsequently, each transcript was coded by a single researcher, with regular meetings with the full team to maintain trustworthiness (Whittemore, Chase, & Mandle, 2001). Disagreement in code applications or emergent themes was resolved via consensus. All organization and coding was accomplished using Dedoose software (SocioCultural Research Consultants LLC, 2017).

To understand the use of HIT tools in the implementation of BIP, we analyzed codes related to general implementation or program design, use of HIT in implementation, implementation barriers and facilitators, and stakeholders' recommendations/wishes. All text excerpts within these codes were extracted into a sortable database that permitted filtering by code and respondent characteristics. Text excerpts were organized into thematic trends by the two coders and discussed during multiple structured debriefings with the research team to identify key themes reflective of technology use in the implementation of BIP.

Results

We conducted 23 interviews with 30 people, including 10 Medicaid administrators, 10 service agency managers and providers, and 10 consumer advocates. Our interviews uncovered multiple themes pertaining to 1) challenges and unintended consequences of implementing HIT in BIP and 2) real and anticipated benefits of using HIT in BIP, for HCBS and across the LTSS system more broadly. Below we describe each theme in greater detail, with exemplar quotes provided in Table 1.

Challenges to implementing HIT within BIP and LTSS

Medicaid administrators as well as service agencies/providers and consumer advocates highlighted various challenges and unintended consequences of using HIT tools to facilitate BIP implementation and in the LTSS context more broadly, including: i) time-consuming and administratively burdensome vendor and procurement processes; ii) inadequate knowledge and familiarity with HIT; iii) limited reach of HIT among certain populations; and iv) resources needed to sustain HIT solutions.

- Vendor and Procurement Processes: A key challenge raised by many Medicaid administrators was the process of identifying, hiring, and partnering with an HIT vendor. Respondents described lengthy and administratively burdensome procurement processes that significantly delayed BIP implementation in their states. Respondents also described how the longer-term process of working with

a selected vendor to build an appropriate, agreed-upon HIT solution sometimes proved challenging and time-consuming, even leading to terminated contracts.

- Inadequate knowledge of HIT tools: Non-administrator respondents more often described the challenges with implementing HIT solutions as a function of the state's knowledge and familiarity with HIT rather than as a function of the vendor partnership. Some consumer advocates and service agency managers reported that long-standing reliance on paper-based systems led to a lack of necessary expertise in technology and informatics.
- Limited reach of HIT among certain populations: Administrators, providers and advocates frequently highlighted the potential for disparities in consumer access to BIP and other HCBS programs resulting from the decreased reach of HIT tools in rural areas or among lower literacy populations or those with significant physical or cognitive impairment. Limitations included poor or no internet access in some areas, lack of beneficiary access to computers, and lack of familiarity or experience using computers or the web.
- Resources necessary for sustainment: Advocates and providers commonly cited sustainment as a potential challenge to HIT effectiveness, given the effort and resources necessary to maintain an HIT intervention. They described likely challenges associated with keeping available functionalities current (e.g., updating existing software; evaluating the utility of new applications, maintaining security standards), and testing and validating electronic data accuracy regularly. Many respondents expressed uncertainty about whether HIT solutions implemented under BIP could be sustained beyond BIP and be expanded to the LTSS system more broadly.

Real and anticipated benefits of using HIT in BIP and LTSS

Despite the potential challenges expressed, respondents also described strong support for the expanded use of HIT for HCBS and cited several benefits to using HIT in BIP implementation: i) reduced processing time and thus faster service initiation; ii) improved coordination across HCBS providers and other related programs; and iii) improved consumer experience including greater ability to self-direct care.

- Perceived value and support for HIT: Medicaid administrators, in particular, commonly described an overarching belief in the value of HIT in BIP implementation and emphasized a general need to use HIT to overhaul and modernize the HCBS system. Indeed, for some administrators, the desire to incorporate HIT tools in their programs was a key rationale for their state's decision to apply for BIP. While they acknowledged that using HIT in HCBS would require a major cultural shift in their state's broader LTSS ecosystem, they maintained the importance of moving from an almost exclusively paper-based system to electronic data capture and transfer.
- Increased self-directed care: Administrators often described how HIT in BIP could enhance a beneficiary's ability to self-direct their care by giving consumers and family members/caregivers access to a single source of information about all

categories of services available, allowing them to explore and select resources at a pace that matched their needs and comfort level. They noted that the centralized website allowed beneficiaries to navigate and select from services, complete their own applications, identify potential program referrals, and connect with providers.

- Reduced processing time/faster service initiation: Some administrators described how bringing eligibility and applications systems online increased the speed at which applications could be processed and services initiated. They described how the time-consuming paper process often delayed consumer access to needed services and was prone to error, while an electronic/online system could speed up the process and ensure that the right services were provided in a timely manner.

Improved coordination across providers and programs: Stakeholders also perceived that HIT improved care coordination and communication. Providers and managers in some states described how online systems were open to all providers, meaning that client information was centralized and could be accessed equally, thereby supporting appropriate service delivery and coordination across providers. Additionally, placing the Core Standardized Assessment online was perceived by agency managers to more readily connect beneficiaries to programs for which they were qualified. Respondents also perceived that having a core standardized assessment in which various assessment approaches could be harmonized into a single assessment increased the objectivity of the screening and needs assessment process.

Discussion

Despite growing use of HIT in other sectors of healthcare, most state and county HCBS systems have continued to rely on paper-based systems. The structural reforms required by BIP provided an impetus for participating states to modernize their HCBS administrative systems. As part of BIP implementation, states utilized HIT solutions to centralize information on HCBS, standardize assessment processes, and facilitate information sharing between administrators and providers, heralding a first step for bringing participating states into the digital age, compared to what one stakeholder described as the “dark ages.” The HIT advances described by stakeholders spanned the timeline of HCBS from the point of system entry, eligibility determination, and care coordination.

Our interviews with Medicaid administrators, agency managers and providers, and consumer advocates highlight critical challenges to the use of HIT, including lengthy and burdensome government procurement processes that may delay service initiation and the lack of extant expertise with HIT within state Medicaid agencies and in the LTSS field at large. Stakeholders also expressed concern about the limited reach of HIT among certain subpopulations of beneficiaries, and the need to sustain the utility and usability of HIT tools. Despite these challenges, stakeholders perceived significant value in modernizing their infrastructure with greater use of HIT. With appropriate attention to identified challenges, stakeholders felt that the key benefits of integrating HIT into HCBS delivery included faster access to services, improved care coordination and improved consumer experience.

Perhaps the most critical challenge raised by respondents were the consumer inequities in access to HIT. All three types of informants expressed concern for beneficiaries living in areas with limited or no internet access (e.g. those in rural areas), and beneficiaries (particularly older adults, consumers with lower socioeconomic status, or persons with more extensive disabilities/functional limitations) with lower HIT literacy who may not feel comfortable using HIT tools. If unaddressed, these beneficiaries could experience poorer access in a fully "modernized" HCBS system than in a paper-based system. This challenge is not unique to the HCBS system. While some research indicates that HIT has the potential to reduce disparities in service and information access, other research suggests that social determinants such as income, rurality, education, age, and gender are associated with variations in HIT use across health care settings (Kontos, Blake, Chou, & Prestin, 2014; Lee, Giovenco, & Operario, 2017; Theis et al., 2019). Attention should be paid to ensuring that greater use of HIT in the HCBS system does not create or exacerbate disparities in access to services (Gordon and Hornbrook, 2016). There are documented best practices that can minimize this potential unintended consequence. For example, accessibility standards such as easy-to-read language in accessible fonts and texts, the inclusion of both text and audio content, using large-size links to make clicking easier, and using guideline-recommended color contrasts and visual structures can ensure access for persons with sensory or motor impairments (Caldwell, Cooper, Reid, and Vanderheiden, 2008). Prior work has shown that improving the usability of informatics tools and employing a user-centered design approach may greatly facilitate use of these tools by older adults (Nahm et al., 2016). Moreover, alternatives such as paper-based forms and telephone or in-person access to service coordinators should continue to be offered to beneficiaries. Such "legacy access" may be especially important for beneficiaries without family members or informal caregivers to help navigate HCBS services.

Another important challenge that plagues HIT implementation across healthcare is the sustainability of these tools and the resources required to stay current. Successful implementation and use of HIT are not a one-time investment but rather an ongoing enterprise requiring regular needs assessments to ensure that interventions match user preferences, program advances require frequent updating to incorporate newer functionalities that facilitate usability and ensure data security. While BIP indirectly provided an incentive to implement HIT, the costs of implementation had to be paid upfront by states and recouped later through enhanced federal matching payment. Moreover, BIP provided no ongoing resources to support the sustainment of HIT tools. Consolidation of local or regional HCBS agencies as seen in some states (Arora, Ashida, Mobley, & Sample, 2019) may facilitate economics of scale in terms of information technology and support ongoing investments to sustain the use of HIT. It will be informative to examine the extent to which BIP-related HIT interventions are sustained into the future and what resources states need to sustain HIT.

As an exploratory qualitative study, there are certain limitations to the conclusions that can be drawn from our analyses. We examined perceptions of stakeholders from within 8 states that participated in BIP in order to better understand if and how HIT was utilized in their implementation of BIP components; findings may not be representative of all states. In particular, states who chose not to participate in BIP or were otherwise ineligible (e.g., if

their HCBS spending was more than 50% of Medicaid LTSS expenditures) may be systematically different in their use of HIT for HCBS. Future research might examine how HIT is utilized in general across the LTSS system among a wider range of states, including states that did not participate in BIP or similar demonstration/innovation programs, to identify challenges and opportunities more broadly. Although we captured the perspectives and experiences of 30 interviewees across 23 interviews, participants represented 3 different stakeholder groups and as such our findings do not reflect the potential universe of stakeholder perspectives. In particular, we may not have captured important differences in program design across states that likely influence the barriers and facilitators to using HIT in HCBS. Still, they provide initial insight into the barriers and facilitators to incorporating HIT tools to facilitate HCBS. Finally, our interviews were limited in scope to the context of HCBS and the role of HIT in facilitating entry into HCBS. We did not specifically query interviewees about if and how HIT facilitated transitions to/from acute or long-term nursing home stays, though this could contribute to broader understanding of the use of HIT in LTSS.

The benefits and challenges to using HIT to facilitate LTSS rebalancing was a key and emergent theme from our interviews, underscoring its importance in future efforts. HIT may provide an important avenue for increasing access to HCBS for some older adults and people with disabilities, although care must be taken to assure that it does not exacerbate extant disparities. Those who pay for, implement, or evaluate HIT use in HCBS should ensure the tools match the needs and preferences of end-users, particularly persons with impairments, those living in rural areas, or those without caregivers, to mitigate disparities in how HIT facilitates access to HCBS. Moreover, although BIP catalyzed some HIT reforms, incentivizing HIT adoption by itself may not be sufficient. States will need support for implementing and integrating HIT into their processes (e.g., help with vendor procurement or training) and meaningful modernization will require greater long-term investment to sustain change. Additional research will be necessary to further understand variations in uptake of HIT across states and to identify opportunities to leverage HIT to increase access to HCBS and the LTSS system more broadly. Though the promise of HIT for bringing the HCBS system into the digital age is clear, it will require thoughtful planning and strategic support to ensure its benefits are fully realized for all consumers.

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Appendix: Sample Interview Questions, Medicaid Administrator*

1. What were the primary motivators for [State] to apply for the BIP? *[Probe for reasons for and against applying for BIP]*
2. How did your existing health or long-term services and supports (LTSS) infrastructure (e.g., waivers, programs; staffing) influence the way your state

approached the decision to apply for BIP? [*Probe*: policy trends in the department, existing infrastructure, support within or outside of the department, active stakeholder community]

3. Can you describe the timing of your application relative to the CMS announcement for BIP applications, and what factors affected this timing? *[Probe on reasons for timing of application]*

4. Who were the key stakeholders involved in the decision to apply for BIP? In what ways were they involved?

5. Can you describe any differences between groups in terms of their access to or use of HCBS? For example, differences between racial/ethnic groups, or between different communities such as the disability community and the behavior health community?

    a. Geographic differences, such as between rural vs urban areas?

    b. Differences related to family structure, e.g. whether a beneficiary has a spouse or children?

    c. Other differences among demographic groups in terms of access or utilization of HCBS during the pre-BIP period?

6. I'm interested in hearing what the actual rollout of BIP looked like in your state and specifically how you rolled out the three core components – the no wrong door, the core standardized assessment and conflict-free case management. Were there specific stages of rollout and what were these?

7. In thinking about implementation of each of these components that you describe, to what extent did you leverage existing program structures during the rollout and was that helpful?

8. How did the timing of the application impact the rollout of these BIP components – did it facilitate implementation? Did it raise challenges to implementation? Did the timing make a difference in your rollout?

    Your state may have implemented or operated other programs concurrently with BIP, such as certain LTSS waivers or Money Follows the Person. Can you describe how these programs interfaced or interacted with BIP? How has the LTSS system in your state changed as a result of these programs and programmatic changes?

9. Can you describe what some of the key overall challenges were to implementing BIP in your State? *[Probe: political factors, logistical factors, finances/money flow, public communication, coordination between actors, advertising, start-up hiccups?]*

10. Can you describe anything that you felt made the implementation of BIP in your state smoother or facilitated the process in general?

Looking back on the implementation process and all the different stages of implementation, what would you do differently about implementation? Is there any way you would have approached implementation differently if you'd had more time?

11. Since the implementation, what do you think are the most successful or promising outcomes of the BIP program? To what extent do you think these changes due to BIP, due to other programs that were operating concurrently, or to the combination of all of them together ("synergy" between programs)?

12. Now that BIP has ended, in what ways would you say access to or use of HCBS has changed? *[Probe for structural or programmatic changes, changes in access or utilization, change in number or type of services].*

13. We've talked a bit about differences in access and use of HCBS. Are some groups (for example, some of the groups you mentioned above) in your state more likely than others to use HCBS instead of institutionalized care? If so, why?

14. Have you seen any evidence about the effects of the program on the health or quality of life of beneficiaries receiving HCBS?

15. We know that states were required to submit service, outcome, and quality data to CMS as part of the program. Can you tell us a little bit about the kinds of information/ data that you've seen that have helped you get a sense of what the impact of BIP has been on your state's HCBS/LTSS landscape?

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Table 1:

Exemplar Quotes from Stakeholder Interviews

Theme	Subtheme	Exemplar Quote
Challenges to implementing HIT	Vendor and Procurement Processes	• "We've had issues with two different vendors now, not being able to deliver the tools to our specifications and so we've had to discontinue contracts". (Medicaid Administrator) • "It's like a soap opera. We also had problems with our first software vendor… So we had to terminate a vendor contract at that point and then kind of start again, so going through the state procurement process, that took us. several months, but that was time lost." (Medicaid Administrator) • "Now, as far as the other requirements, like the information and referral LTSS website, that's gone really well. We have a great vendor who built that for us and it actually is live. We were able to launch that early because it's a resource for anyone in [state]." (Medicaid Administrator) • "Of course, one of the bigger problems they had was the whole software thing, you know the interface software so that people could apply directly for benefits. They spent a long, long time with a software company that it didn't work out but instead of seeing it at the onset that this isn't working out…they kind of were getting pulled along down a longer road with this software company and thinking all we've got to do is problem-solve and troubleshoot and eventually we'll get there. When someone just said, "You know what? This company is not helping us. We need to start all over." That was one of the setbacks of rolling out BIP." (Consumer Advocate)
	Inadequate knowledge of HIT tools:	• "You know it's one of the downfalls when you're working with Medicaid agencies, they're not software experts. We're talking about a revolution in the way we operate our information systems, right…because you're switching from paper files over to much more…technologically advanced information systems and you don't have people within the state Medicaid agencies that have that knowledge or expertise as part of their job qualification or scope, right?" (Consumer Advocate)
	Limited reach of HIT among certain populations:	• "There's many sections of the state that have little or no internet access. My particular crowd of people that I serve, they don't have computers. We're talking people who have next to nothing and they don't have the ability to access, let alone the understanding of how to use it. I do think that the state is relying heavily on internet use and online access and they don't have the ability to do that. So I think that's been part of a barrier." (Service Agency Provider) • "Well, some of the gaps, I kind of alluded a little bit towards the benefits and the eligibility process and in this particular area, there is no, for example, Medicaid office, local district office. Again, BIP's solution was, oh it's online. Well, they also have no computers or education or ability to use a computer. So it was a huge gap." (Service Agency Provider)
	Resources necessary for sustainment	• "…because I'm leery of any software that's getting old because I just…you know, the way people manage information and have duplications. That was the other big problem that the state had. They had incredible amounts of duplicated information or like three addresses for one person. It was just a…they had so much to cleanup once that new software came. The question that I would want to know is this software capable of keeping that information current?" (Consumer Advocate) • "Actually, my hope was, I did it just seeing if I could just recertify through the platform, so there wouldn't be any mistakes. And that's not an option, you cannot do that. The platform does not allow you to do that." (Consumer Advocate)
Real and anticipated benefits of HIT	Perceived value and support for HIT	• "…we were kind of in the…dark ages as far as our infrastructure, so having any opportunity to pursue the implementation of electronic tools to make use more efficient, more effective…was motivation for us to pursue BIP funding" (Medicaid Administrator) • "there's always a culture change and some grumbling but…the difference between doing something on a piece of paper and having it in a system where it's automated is huge". (Medicaid Administrator)
	Increased self-directed care	• "You can look at all these different areas staying within this website and you don't need to think about where you need to go… The individual could fill it out themselves and print it out themselves and then proceed to follow-up. They could choose to or choose not to pursue certain services…by keeping it close to the individual we're hoping to overcome some of the reluctance about public assistance." (Medicaid Administrator) • "…if you were a family member or an individual or a caregiver and you needed information about what services this department could provide, there was not one central place…there was no cross reference, no sharing of information among our own internal units. So we created a brand new comprehensive website. We took information from all of these existing programs. We standardized the look of the website. We made it so that right up front you could either directly query for information, or you could see 13 or 14 different categories of services available. And so you were allowed to go in there, explore, see what resources are available." (Medicaid Administrator) • "I think [No Wrong Door] is increasing the people who are seeking home and community-based services." (Consumer Advocate)
	Reduced processing time/ faster service initiation	• "Once they're in the system, they're able to get to services faster. We weren't moving as fast as we could through the paper system because it just wasn't an efficient system and it was time consuming. This electronic system has helped us move faster through those, to help get people services faster." (Medicaid Administrator) • "I think that there was progress made in…entry into the system, so that there was no wrong place for a person with a disability to present themselves. Progress

Theme	Subtheme	Exemplar Quote
		made towards ensuring that all community partners were more able to get people to where they needed to be and not just say, “We don’t provide that service.” Or “We don’t know where you go” and be done with it. So they were able to smooth those transitions of people coming into the system.” (Service Agency Manager)
	Improved coordination across providers and programs	• “we put in place a shared data collection system that our providers use. That’s how they do the core standardized assessment and get it into the system and apply for services now.” (Medicaid Administrator) • “Programming was done to allow providers to be able to get into our system, access the information that we had about their individual clients, and allowed for sharing of that information because now the mental health center and the developmental service agency could both see the information not only that they had in their system, but what we had as a central state system about each individual. That was a huge advance”. (Medicaid Administrator) • “We created the core standardized assessment which is also placed on one website and is linked to many other public facing websites so that staff can access it or individual recipients can access it and fill it out and then it will take them into what we call the hallways, to a particular program or to refer them to other services, if they don’t qualify for the federal or state programs.” (Medicaid Administrator) • “There was a great emphasis on expanding the network statewide, adding the other components that were required, the 1-800 number, the website with the resource directory that had resources across all populations and putting into place the local hubs and the relationships at the local level, to engage partners who were serving other populations.” (Medicaid Administrator)