Community Resource Inventories:
Empowering Colorado's S-HIE ecosystem to partner with community based organizations

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About OeHI:

Colorado established the Office of eHealth Innovation in 2015 to manage and advance the state's health information technology (IT) strategy.

OeHI
Office of eHealth Innovation

Contents:

- Project background
- Research questions
- Methods
- Findings
- Recommendations
- Limitations
- Future Research

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Colorado's Social-Health Information Exchange Ecosystem

The State of Colorado's Office of eHealth Innovation is designing a statewide Social-Health Information Exchange (S-HIE) ecosystem that aims to address gaps in social and clinical care coordination through collaboration with regional S-HIE hubs. S-HIE systems integrate community resource inventories (CRIs) with existing Health Information Exchanges (HIEs) to help providers and care coordinators connect individuals with community-based organizations (CBOs) that manage and distribute social services and resources.

The Project

Prior to this study, data standards and information management processes employed by CRIs and S-HIEs had not been cataloged, nor had regional and statewide efforts undergone comparative analysis. This research aimed to understand key components of successful interoperable interfaces and address challenges in interoperability to support Colorado's S-HIE ecosystem design and further OeHI's goals of improving information access, providing digital health services, and promoting health equity through technological innovation.

“I NEVER HAD TIME TO FILL OUT THOSE LITTLE EMAIL SURVEYS, UPDATING MY INFO - THEY FALL AT THE BOTTOM OF THE LIST. IT WAS WHEN THE 211 STAFF SHOWED UP AT MY DOOR AND SAID, 'SERIOUSLY, JACKIE'... I WOULD DO IT.” **-On organization struggles of updating data for CRIs**

Research Questions

- What is the Colorado landscape of community resource inventory data, and how is it being collected, stored, and shared?
- What is the national landscape of community resource inventory operability and innovation? What have other states done to promote interoperability?
- How to best incentivize the involvement of CBOs in the CRIs to increase participation in closed-loop referral systems with health providers?

Methods

We identified variables through review of the Colorado Health IT Roadmap, S-HIE white paper, and academic journals. Data sources were obtained through recommendations from OeHI, snowball referrals from subject matter experts (SMEs), and through targeted web searches. Our primary method of collection was SME interviews, which was supplemented by secondary data analysis and a national interoperability survey.

SME interviews

- Colorado
  - 11 SMEs
  - 24 questions
- National
  - 4 SMEs
  - 30 questions

Secondary data analysis

- 9 national organizations
- Online searches and organization websites
- Key phrases included “social determinants of health,” “community resource inventory”

National CRI Interoperability survey

- Google Forms
- Sent to all 50 states’ HIE managers
- Generated 5 responses, 2 of which are working toward interoperability

Interviews were conducted and recorded using Zoom and Google Meets. We transcribed audio using the Otter application, then reviewed alongside the original recording. Interviewers acted as the first coder, and a second coder reviewed transcripts and recordings for quality assurance.

FINDINGS

Colorado

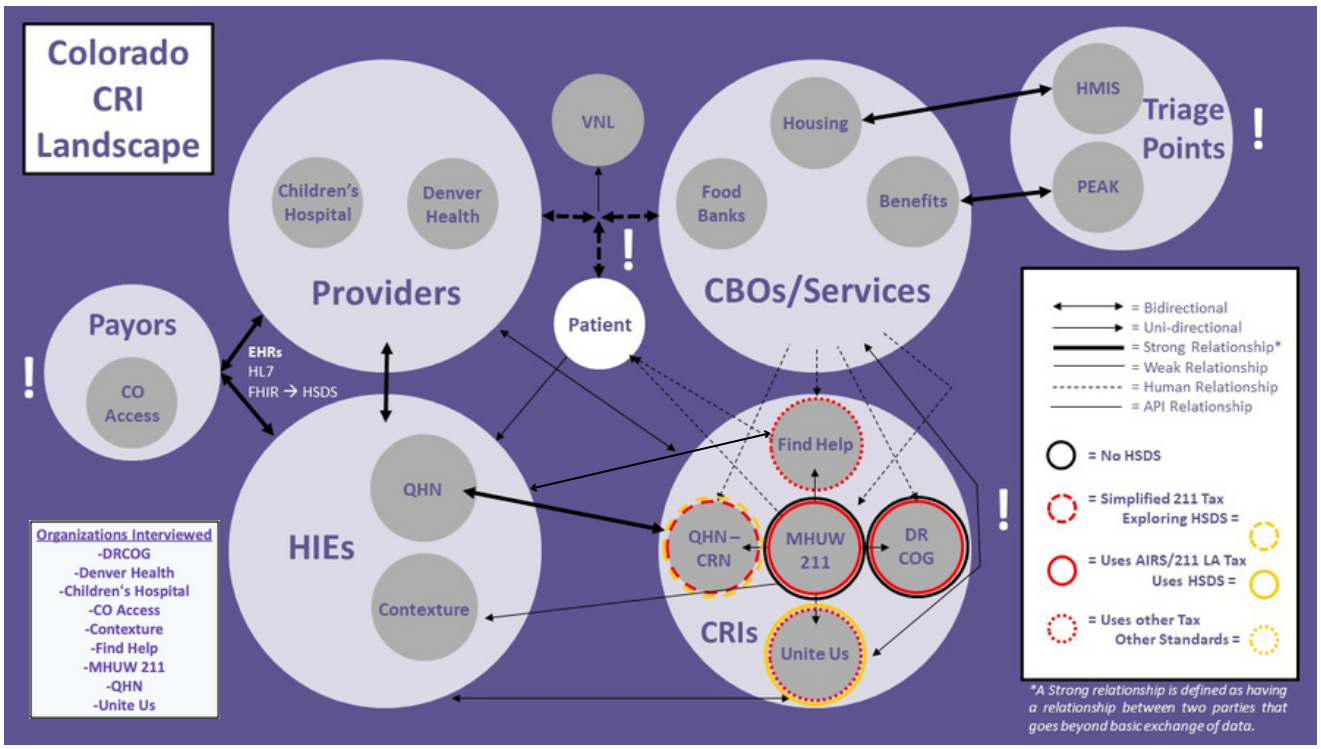

Figure 1: Colorado Community Resource Inventory Data Interchanges

Data Standards

CRIs primarily use data to connect people to social services to address SDoH. The research identified a need for ubiquitous data standards as a quality assurance mechanism. Standardization factors that emerged included unique identifiers, service taxonomy, and data exchange standards. The AIRS/211 LA Taxonomy is the most standardized, comprehensive form of coding, but it is reportedly too complex for public users. Still, half of CRIs reported utilizing the LA Taxonomy or a more simplified version of it. Seventy percent of SMEs identified a need for a unique identifier for each CBO, and fifty percent of CRIs are currently using or considering employing Human Services Data Specification (HSDS) standards. Quality assurance also requires CRIs to remain familiar with local CBOs, and this is especially important for larger CRIs. It is common to allow partners and CBOs to maintain a level of autonomy around data update processes, though inclusion typically hinges on compliance to agreed-upon standards. In addition to data standards, experts also noted a need for intuitive and simplified search and tagging language.

Funding

Public funding for provider/CBO involvement in CRIs, like technology upgrades, training and education etc., is vital to buy-in, especially for CBOs. Wade Treichler (MHUW) expressed, "There's no incentive for [CBOs] to [participate]... we're gonna send you referrals. And frankly, that's more work. And you're not... getting paid for that. It's not like the Medicaid model."

Technology

APIs are used to send, receive, and update data. All eight organizations in Colorado use APIs to send and/or receive data. APIs facilitate updates and exchanges between CRIs and CBOs, EHRs, and other CRIs. Specifically, four mentioned using APIs to make closed-loop referrals. The CRIs have unidirectional (n = 2) or bidirectional (n = 3) capabilities, where they either have capabilities in data storage and access or in exchange between CBOs and providers. CRIs also manually integrated data for search, connection, and follow-up, when CBOs do not have the technical capacity to use APIs. One SME suggested similar data standards will help in developing interoperable systems.

Human Factors

One of the largest emerging themes was the importance of human relationships and intervention. Starting with CBO data collection, 5 out of 8 Colorado CRIs interviewed employ teams responsible for manually updating data. Jackie Sievers, (QHN) who has CBO work experience said, “I never had time to fill out those little email surveys, updating my info - they fall at the bottom of the list. It was when the 211 staff showed up at my door and said, 'seriously, Jackie'... I would do it.” Similarly, 5 of the 10 SMEs we spoke with referenced the importance of close, personal relationships between CBOs and providers in the success of a referral, identifying a lack of trust in large-scale CRIs, and a preference for personal networks. Dr. Danielle Varda (VNL) observed, “These small organizations, they are not that interested in the big ones [CRIs], because they're not personalized enough.” Finally, 2 of the 10 SMEs mentioned that regardless of the quality of data standardization, there would always be a need for people to clean the data.

FINDINGS

National

Data Standards

Like data standards among Colorado-based CRIs, statewide and regional CRIs and S-HIE systems across the nation employ universal data standards that include a shared taxonomy, organization identifiers, and exchange standards.

Funding

Many small organizations (especially non-profits) do not have staff or funds to establish new technology to connect with these networks. Allowing public funding to remove the burden of interoperability from these organizations is a tool used in several states to promote engagement. Moreover, finding ways to implement payor buy-in to increase funding for CRI/HIE networks is widely referenced.

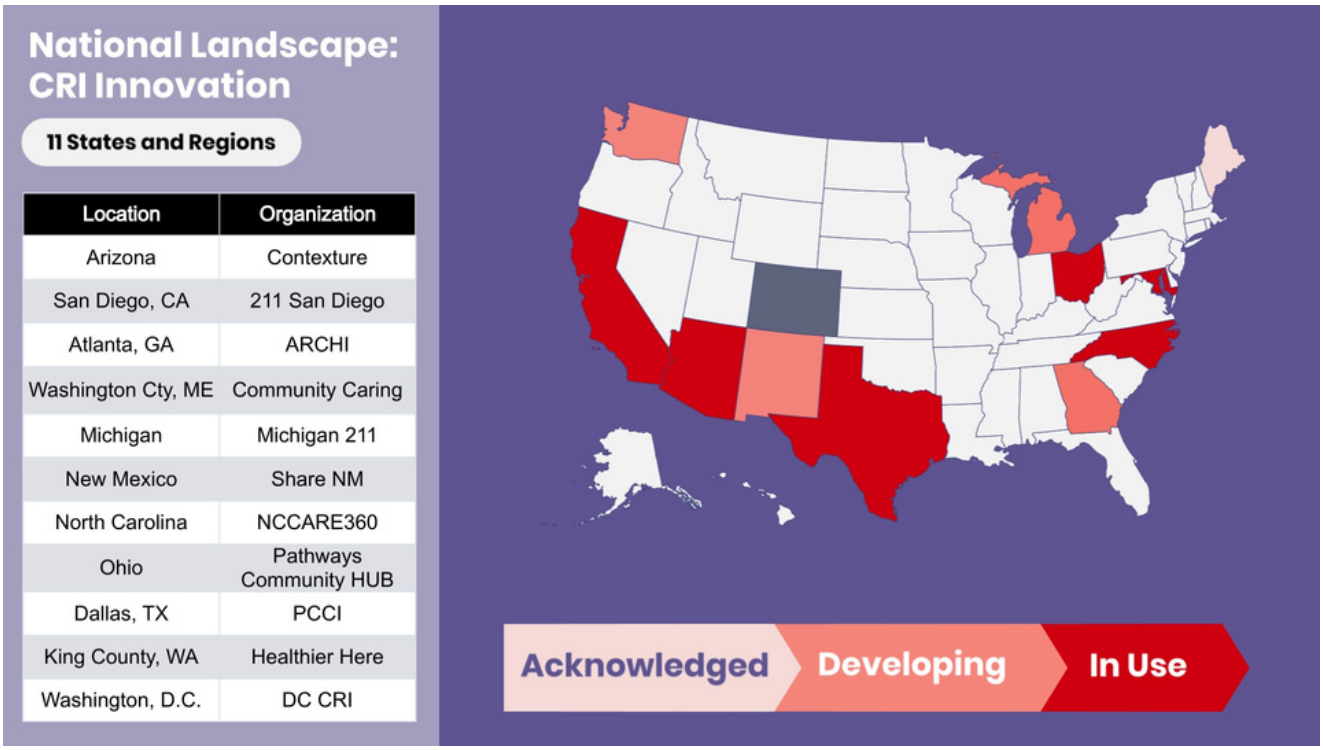

Figure 2: National Community Resource Inventory Innovation and Interoperability Map

Technology

CRIs outside Colorado had similar technology themes. Five mentioned using APIs, three are in the development process, and two manually integrate. Two are unidirectional, and six are bidirectional. Three mentioned the importance of promoting a vendor/software "agnostic" model, in which data could be exchanged regardless of the systems currently in place. The provision of resources and technical support from the state can aid CBOs in complying with standards. Of note, six credited having shared data standards and four credited having a middleware to assist in data exchange to allow CBOs to interface with CRIs.

Human Factors

National research also highlighted the importance of human factors in an effective S-HIE ecosystem. Manual connection is crucial. Greg Bloom (OpenReferral) stated, “The very biggest challenge is that people assume this is a technology problem... they should have just invested in the capacity for people to make phone calls, and do so in a way that makes sense.” Relationships also impact governance. One must consider power dynamics within a S-HIE system designed primarily by the health sector. Align for Health has recommendations for cross-sector engagement based on research by Dr. Jean Flatley McGuire, stating, “Cultural, power, and perception differentials are considerable. Human services feel disrespected; health care is worried about what they can rely upon. The disconnect is present in governmental structures”(21). Despite S-HIE reliance on technology, this must be predicated by the building and honoring of human relationships.

Governance

Specific governance structures and standards need to be in place. Interagency collaborations through official agreements are imperative in smooth exchanges of information, as well as providing space for input from providers/CBOs. Additionally, a board or committee is established to ensure adherence to these standards.

Recommendations

- Develop ubiquitous data standards including taxonomy and CBO identifier.
- Promote an “agnostic” approach, under which systems are able to send, receive, and update data regardless of what existing systems they use.
- Promote API access for CBOs and use of a middleware when organizations are sending and receiving data.
- Allow providers and CBOs to input and expand on existing personal networks and inform the design and governance of the S-HIE.
- Do not rely exclusively on technology as the solution to this problem, and be prepared for the cost of staffing to manage data.
- Establish governance standards, interagency agreements, and cross-sector board leadership.

Limitations

This research was limited in the breadth of organizations covered, by the narrow time window in which to collect data and the challenges we faced in connecting with national SMEs for interviews. It is also limited in depth by both the foundational knowledge of the researchers and the wide range of organizational types we studied. We attempted to address these limitations by drawing on overarching themes while highlighting specific examples relevant to Colorado's case study.

Future Research

Future studies on the development of a statewide S-HIE ecosystem should focus on two areas: *technology* and *program design*. *Technology*: research is needed to more closely examine the specific APIs each organization uses and what platforms are compatible with each API. *Program Design*: further research is needed to understand existing CBO networks and how they may align with network efforts happening in the health field. Finally, there is opportunity for collective learning with other states and regions across the country who are beginning to undertake similar projects.

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