Understanding HIE and CIE Alignment

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Propelled by local and government demand for services coordination across health, behavioral health, housing, and other social services, the concept of Community Information Exchange (CIE)[i] is gaining momentum in communities across the country. As explained by my colleague Keira Armstrong [here](), CIE enables collaboration and data sharing to address social determinants of health through whole person care approaches.
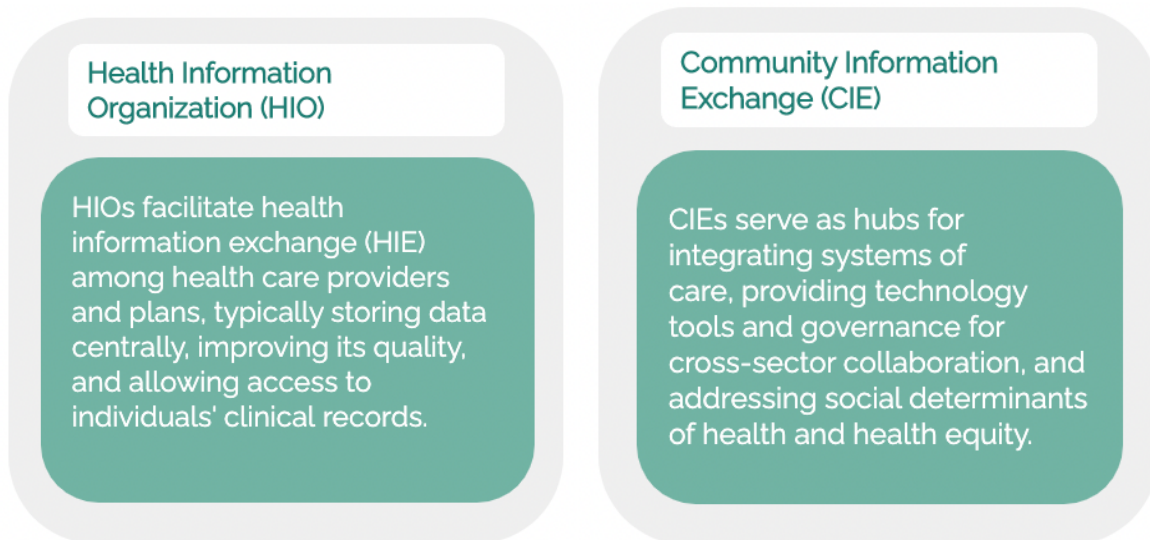
In this post, I contrast Community Information Exchange (CIE) with Health Information Exchange (HIE) to cast into relief important differences, highlight core similarities, and explore the alignment of HIE and CIE services. A primary goal here is to assist health care colleagues who are familiar with HIE to grasp more concretely the opportunities and challenges of CIE and what they mean for our field. I conclude with considerations for HIOs that wish to expand to offer CIE services and, on the other side of the coin, offer recommendations for CIEs that seek to leverage the value of health information exchange in their communities.

What's in a Name?

It has become standard practice to refer to the act of health information exchange ("the verb") as HIE (or "data exchange"), while referring to organizations that facilitate and manage HIE as Health Information Organizations (HIOs). In contrast, the term Community Information Exchange (CIE) designates both the act of engaging in CIE and the organizations dedicated to facilitating this activity (CIEs). I will focus here on HIOs and the services they provide rather than on broader national EHR-based networks for data exchange given that CIEs have much more in common with HIOs than with the national networks.

The name "Community Information Exchange" bears a clear resemblance to "Health Information Exchange," and "CIE" likely was coined in reference to "HIE." Whether intentional or not, the name "CIE" gives the impression of describing the same phenomena as HIE, but with a twist: a focus on the community level of exchange and the inclusion of non-clinical data from social and human services. However, as we will see, CIE generally does not simply take the form of HIE and sprinkle in some additional data elements; while they do share important characteristics, there are fundamental differences in orientation, services, and aims. **In short, while HIOs facilitate data exchange among health care providers and health plans for a complete historical clinical record, aspects of which can be delivered into**

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clinical workflows, CIEs serve as user-facing collaboration hubs for coordination of services across sectors.

Health Information Organization (HIO)

HIOs facilitate health information exchange (HIE) among health care providers and plans, typically storing data centrally, improving its quality, and allowing access to individuals' clinical records.

Community Information Exchange (CIE)

CIEs serve as hubs for integrating systems of care, providing technology tools and governance for cross-sector collaboration, and addressing social determinants of health and health equity.

Many programs, for instance Medicaid delivery system integration efforts such as the 1115 Waivers in California (CalAIM) and New York (DSRIP 2.0), require significant CIE services but do not use the term "CIE" to denote them – reflecting the fact that we are dealing with emerging phenomena without fully settled naming conventions. As this and our companion piece describe, we take a broad view of CIE as the best single lens – to date - through which to understand a range of related activities and infrastructure.

Similarities and Differences

The table below compares HIOs and their HIE services with CIEs and their CIE services; this mapping represents core prototypes of each category and may not apply in marginal cases.

	HIOs/HIE	**CIEs/CIE**	**Key Similarities and Differences**
Mission	Facilitate clinical data exchange among health care providers to improve health care services and outcomes	Enable cross-sector collaboration addressing social determinants of health through shared governance and technology	**Similarity:** Foster coordinated care across organizations serving shared populations **Difference:** While HIOs emphasize exchange of historical clinical data, CIEs focus on enabling

			collaboration across sectors
Multi-Purpose Infrastructure	With robust clinical data density, HIOs support a multiplicity of health care use cases, programs, and needs	With robust governance and technology for collaboration across sectors, CIEs support a multiplicity of use cases, programs, and needs	**Similarity:** Both HIOs and CIEs provide multi-purpose infrastructure that breaks down organizational and program siloes in defined communities or regions **Difference:** HIOs support health care-focused use cases and programs, while CIEs support cross-sector-focused use cases and programs
Service Area	Regional or state	Generally more focused in a local region or community	**Similarity:** Value increases with local data and user density **Difference:** CIEs tend to focus on similar or smaller regions than HIOs
Participants	Health care providers, plans, and government partners	Same as HIOs plus social and human services, CBOs, and community resource directories (such as 211s)	**Similarity:** Multiplicity of organizational participants **Difference:** Whiles HIOs focus on clinical organizations, CIEs have a much broader footprint
Governance and Leadership	Typically regional or state-level non-profits or private-public partnerships	Typically local/ regional non-profits or public-private partnerships	**Similarity:** Both benefit from stakeholder governance via a non-profit structure **Difference:** HIO governance is now well established, whereas CIE governance bodies bring together partners across sectors on boards and committees, requiring more time to align goals, agreements, expectations, and capabilities

Functionality	Move clinical data between participants' IT systems; build a centralized data repository to create a longitudinal patient record; clinical alerts pushed into participant EHRs; analytics and population health management, among other services. Typically read-only access to historical information, with some data pushed into participants' systems for their usage and manipulation in workflow	Assessments/ screenings; eligibility/ enrollment; shared care planning and curated care record; closed-loop referrals, especially between sectors (such as health care to social services); other workflows for distributed care teams; consent management Typically read-and write-access to data in user-facing collaboration tools Note that CIE, from our perspective, is much more than a referrals network as it is sometimes defined; it is also much more than the addition of SDOH data fields to an HIE record	**Similarity:** Aggregation of data from multiple sources with user views into relevant, actionable data **Difference:** HIOs facilitate clinical data exchange between disparate systems and provide access to longitudinal individual records and population analytics; CIEs provide a platform for care coordination across disparate organizations, which may include user access to individual care plans or records and population analytics
Data	Primarily clinical data to date (patient demographics, procedures, diagnoses, problem lists, lab results, medications, claims, etc.), with feeds from all participating organizations; HIOs may serve as a "source of truth" with a comprehensive patient clinical record	Mix of clinical, SDOH, and social services data generated by usage of a shared CIE platform, often enhanced by data feeds from external sources with actionable information; platform may be accessible within EHRs or other systems via Application Program Interfaces (APIs) or Single Sign On (SSO)	**Similarity:** Data integration across organizations **Difference:** Data integration and exchange is an HIO's core function, whereas CIEs focus on actionable data that directly supports effective workflows in their network

Data Governance	Well-established mechanisms for data governance anchored in participation agreements, P&Ps, security controls, and adherence to laws and regulations; state law creates some variability and uncertainty, with data falling outside "the HIPAA tent" often simply not included in HIO data sets (e.g. substance use data governed by 42.CFR.2, and mental health information in some circumstances); individual consent is gathered and managed in a minority of regions (e.g. in NY)	Emerging mechanisms for data governance similarly anchored in data sharing agreements (DSAs), P&Ps, security controls, and adherence to a broader set of laws and regulations; gathering and managing individual consent, often in the form of a broad multi-use consent which covers multiple data types, programs, and uses, is a baseline requirement for most CIEs	**Similarity:** Overall alignment in basic data governance frameworks, largely driven by clinical data protection needs **Difference:** The majority of HIOs do not gather individual consent for data sharing, defaulting to clinical organization NPPs and staying in the HIPAA tent, preventing themselves from being able to offer CIE services; CIEs, in contrast, have built advanced consent gathering and management practices into their core operations, enabling them to address a much broader spectrum of use cases and data to support whole person needs
Funding	HIO revenue is primarily generated through participant subscription fees, with government grants and other funding a secondary source	CIE revenue is generated through subscription fees paid by health care participants (CBOs often don't pay), with government grants and other funding an equally important source	**Similarity:** Combination of subscription fees and government funding **Difference:** While core HIE services have established revenue streams, significant new funding is supporting CIE

Integrated or Complementary Services?

Five or so years ago, one might have realistically imagined that HIOs would add CIE services – such as technology for community-level care coordination and closed-

loop referrals between health and social services – to their offerings. Medicaid agencies in states like California and New York were pouring billions of dollars into the alignment of the Medicaid delivery system with social and human services to address social determinants of health and complex care needs, and data infrastructure was at a premium for this transition. Nevertheless, HIOs largely stayed in their clinical lane, while a new set of coalitions (CIEs, Whole Person Care Pilots, referrals networks, etc.) and vendors (closed-loop referrals, care coordination) emerged to meet the demand. This conservative approach by HIOs has been driven by the structural differences between their historical business model and the emerging CIE model documented in the table above and further elaborated here: from differences in participants and leadership, to data governance and consent, to distinct services.

- **Participants and Leadership**. HIOs are led by Boards of health care representatives from among their participating organizations, with little if any representation from social or human services; they naturally focus on clinical data exchange and workflows; to the extent that HIEs participate in cross-sector engagement, they typically do so from a health care perspective;

- **Data Governance and Consent.** Getting to "yes" for HIE has not been an easy road for most health care organizations, given legitimate concerns about data privacy and security and the use of data for competitive ends. While that set of debates has largely been settled in favor of data exchange, sharing clinical data with social and human services providers has introduced a new set of challenges. In California, state statutes and regulations specific to Medi-Cal's Whole Person Care and CalAIM programs established a "safe zone" for cross-sector data sharing relative to state law. Even so, nearly all of these state-funded local efforts have also implemented comprehensive individual consent for data sharing that covers a broad, multi-purpose set of use cases including both HIE and CIE services. In contrast, most HIOs outside of states such as New York, which implemented an "opt-in" consent framework, do not obtain individual consent due to the perceived administrative burden. As a result, these HIOs, which include all HIOs in California, have essentially disqualified themselves from being able to offer CIE services at scale. This situation is unlikely to change unless there is action at the state level to both mandate and manage individual consents for cross-sector data sharing and collaboration.

- **Service model**. HIOs are in the business of data collection, aggregation, and access. A baseline form of access is a read-only HIE portal with longitudinal, historical patient records. HIOs also deliver some patient data directly into their participants' IT systems so that actionable information can be incorporated into providers' workflows. In contrast, CIEs offer high-touch tools

accessible through a user interface for care coordination with write-to and not just read-only functionality, and it is important for users to operate in the CIE platform itself. They do not attempt to provide comprehensive longitudinal records. To address workflow issues for providers who prefer to stay in their EHR, APIs can enable users to access the CIE platform from within their EHR, although such capability has not been broadly implemented. In any case, the provision of a user interface for real-time collaboration is a departure from the HIE service model of providing access to and delivering historical patient data.

Due to these factors, we have not seen a single HIO in the country offer CIE services at scale - to all of its members and covering all of the population it serves through HIE. Instead, **complementary rather than integrated services have emerged at the intersection of HIE and CIE** where such innovative connections have been proactively pursued. In many cases, HIOs have acted as data-sharing partners to CIE efforts and their core vendors, pushing actionable clinical information to the CIE. This takes advantage of HIOs' core service as clinical data suppliers, albeit to a new type of partner. A small number of HIOs in California have gone so far as to contract with care coordination platforms on behalf of County-led Whole Person Care pilots (we supported such developments in Humboldt, San Joaquin, and Santa Cruz Counties). These HIOs implemented focused data sharing between systems such as the delivery of hospital event notifications into the care coordination platform. Some other HIOs outside of California have begun to contract with closed-loop referrals vendors (including state HIE networks in Michigan, Arizona, and Colorado), but it remains to be seen how they will integrate such services with their core HIE offerings. In all of these cases, CIE services have been developed through parallel technical and governance infrastructure to HIE, rather than being integrated into the HIO's governance and technical infrastructure for HIE. Alameda County's Whole Person Care Pilot has perhaps gone the furthest, building a new Social Health Information Exchange from the ground up with its vendor partner UpHealth that offers many HIE and CIE type functions; the County is now in the process of exploring full HIO status within California's structure for data exchange.

Conclusion

HIOs and CIEs share a number of important structural features, such as data exchange across organizations to improve services and outcomes, multi-purpose infrastructure, multi-stakeholder governance, and a value proposition driven by the density of participation among organizations serving a shared population. However, they have distinct service models, different participant and Board profiles, and the majority of HIOs that do not obtain patient consent have an additional barrier to

merging CIE services with HIE. Given this confluence of factors, CIEs will likely continue to emerge as distinct coalitions and networks in many regions, while some innovative HIOs will contract with CIE vendors to offer specific CIE services for a subset of their members and population, positioning them to explore deeper integration over time. Across the board, given policy and market demand, HIE and CIE services will become increasingly complementary regardless of their organizational homes - while retaining their unique identities and functions.

Considerations for HIOs that want to expand into CIE. HIOs are well positioned to play a key role in supporting CIE. Below is a list of some ways that HIEs may do so.

- If CIE exists in an HIO's service area, the HIO may offer to serve as a supplier of relevant clinical data to the CIE. This provides a "single pipe" of clinical data to the CIE, saving the CIE tremendous time and effort in establishing inbound clinical data feeds. Data governance of clinical data shared with the CIE would become the responsibility of the CIE to manage, and this should be spelled out in the data sharing agreement between the two organizations.
- An HIO's Master Patient Index (MPI) is one of its most valuable assets, and this asset could be used to support identity management within CIE technology tools, which may not have either the same level of patient-matching sophistication or data for identity management.
- Some communities with multiple vendor networks for social referrals have sought a technology solution to sit in the middle of these networks to direct referrals traffic between them. An HIO could either seek to develop this capability in-house or contract with a third-party vendor to operate such a function locally, potentially leveraging other HIO assets such as the MPI in the process. This aligns with HIOs' commitment to interoperability.
- An HIO may be well positioned to mediate data exchange between different types of CIE tools as well (e.g. a care coordination system and a referrals system), or mediate a CIE's ingestion of data from other relevant non-clinical data sources (e.g. Housing Management Information Systems, jail scheduling systems).
- An HIO may be well positioned to receive specified data feeds from a CIE system to then aggregate social and clinical data and enable population analytics.
- As seen in several examples above, an HIO may manage a procurement process and hold contracts with CIE vendors on behalf of the community.
- In addition to holding contracts with CIE vendors, an HIO with a strong governance structure that can accommodate new members and voices from social and human services would be well positioned to consider serving as the CIE backbone organization in its community.

- **Conducting an assessment of the HIO's governance, technology, and business models** to evaluate the HIO's readiness to embrace CIE could help HIO leadership consider how complementary HIE and CIE services could offer stakeholders cost-effective multi-program infrastructure. Understanding state and federal requirements related to consent, and a potential reconsideration of the HIO's consent model to enable CIE use cases, may yield important insights on both opportunities and challenges ahead.

Considerations for CIEs that want to leverage HIE. In the other direction, CIEs can leverage HIOs in the following types of ways (many of these correspond to an item in the list above, but from the CIE perspective).

- If a CIE effort is early-stage and has not identified a backbone organization, consider the local HIO as part of the selection process for this role. HIOs have years of accumulated experience with multi-stakeholder governance of critical data assets, and may be in an ideal position to expand their scope and leadership structure to serve as the CIE backbone organization.
- Explore engaging an HIO as a supplier of relevant clinical data to the CIE. This provides a "single pipe" of clinical data to the CIE, saving the CIE tremendous time and effort in establishing inbound clinical data. Data governance issues, such as appropriate user access controls, are the responsibility of the CIE, and should be spelled out in the data sharing agreement between the two organizations.
- An HIO's Master Patient Index (MPI) is one of its most valuable assets, and this asset could be used to support identity management within CIE technology tools, which may not have either the same level of patient-matching sophistication or data for identity management.
- Some communities with multiple vendor networks for social referrals have sought a technology solution to sit in the middle of these networks to direct referrals traffic between them. If this is an issue in your environment, consider partnering with an HIO that could either seek to develop this capability in-house or could contract with a third-party vendor to operate such a function locally, potentially leveraging other HIO assets such as the MPI in the process. This builds on the HIO commitment to interoperability.
- If contracting with multiple types of CIE vendors, consider leveraging an HIO to mediate data exchange between them (e.g. a care coordination system and a referrals system);
- Look to the HIO to mediate your CIE's ingestion of data from other relevant non-clinical data sources (e.g. Housing Management Information Systems, jail scheduling systems), if the HIO is able to accommodate such data.

- An HIO may be well positioned to receive specific data feeds from your CIE system(s) to then aggregate social and clinical data and enable population analytics, resulting in cost-sharing for such functionality between the HIO and CIE.
- Consider partnering with an HIO to serve as the contract-holder with all CIE vendors to centralize vendor management; if the CIE backbone organization is separate from the HIO, it would execute an all-in-one agreement with the HIO for these services;
- **Conduct an assessment of the CIE's governance, technology, and business models** to evaluate readiness to engage with an HIO, ingest clinical data from the HIO, and effectively align services. If the HIO collects patient consent, evaluate whether the consent form and process can be expanded to support cross-sector collaboration and data-sharing. Consider how HIO and CIE alignment offers stakeholders cost-effective multi-program infrastructure.

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[i] CIE(R) is a registered trademark of 211 San Diego. For more information about the trademark, see the following webpages on the legal status and brand guidelines for the term.