CHCF Issue Brief

Health Information Exchange in California:
Overview of Network Types and Characteristics

MARCH 2021

This interim document is part of an ongoing assessment of the health information exchange landscape that Intrepid Ascent is producing with the California Health Care Foundation. Information contained here is informed by interviews, online research, and industry expertise.

How do health care providers access patient information from outside their practice, clinic, or hospital to deliver informed care? How do organizations and the communities they serve aggregate and analyze patient information to guide population health improvement? How do care teams that span organizations and sectors (such as health care and housing) use data to collaborate and communicate to provide integrated services that address whole-person needs?

This document answers these questions through a high-level overview of the types of infrastructure used to exchange health-related information in California today.[1] The methods identified put information at the fingertips of clinicians, their organizations, and partnering service providers for the care of individuals and populations.[2]

While based on similar technology standards, each type of data exchange infrastructure described is built and organized to address distinct priorities, has specific strengths and weaknesses, and operates differently in scale and geographic distribution. Many of these networks overlap, and organizations often participate in more than one. While the networks represent a significant advance in capabilities across the state, without further progress and alignment they leave significant gaps that contribute to fragmented services for most Californians.

The primary types of health information exchange networks are:

EHR-centered clinical data exchange. A majority of clinical data exchange in California happens through approaches that connect health care providers to each other and to other partners through their electronic health record (EHR) systems. Large hospital and health systems have made significant investments in integrating their data systems, although the use of this infrastructure is limited to their employed and contracted providers and therefore participation is limited. Looking beyond their own organizations, health systems and EHR vendors have organized national networks that enable clinical data to be shared among different users of the same EHR and increasingly among different EHRs. However, vendors implement these data-sharing tools in varying ways, often limiting the access to and utility of these data-sharing methods for provider organizations that lack significant in-house IT resources, which tend to be smaller primary care and specialty practices.

Community clinical data exchange networks. A number of community clinical networks, known as health information organizations (HIOs), operate in California at local and regional levels, with one HIO with operations across multiple regions. While these networks vary greatly in their focus and capabilities, they all exchange clinical data regardless of the EHR systems used. HIOs both augment EHR-centered exchange networks to fill critical gaps and at times compete directly with them. Some HIOs have focused on aggregating data, laying the foundation for population-level insights. Importantly, these networks convene a diverse set of local stakeholders to solve data-sharing problems, fostering trust among them. Some HIOs share data with one another through the California Trusted Exchange Network (CTEN), which also gives them access to national networks, and through the Patient-Centered Data Home, an approach that alerts a patient's "home HIO" of clinical events that happen outside the patient's residing area.

Specialized clinical data exchange networks. A number of private companies operate large-scale data exchange networks that connect many of the same participating organizations as the EHR-centered exchange and community clinical networks, but that deliver a specific type of data or subset of the full patient record. These networks tend to embed data — such as electronic prescriptions, lab results, and notifications to providers — into provider workflow and EHR systems when patients present at a hospital or emergency department, to support efficient clinical decisionmaking at the point of care.

Whole-person data exchange networks. With the widespread recognition that social and behavioral factors largely determine population health outcomes, data-sharing networks have emerged throughout the state that facilitate the coordination of services across sectors so patients can be supported holistically. Many of these emerging networks share the goal of addressing whole-person needs, combining medical, behavioral health, and social data with electronic tools for collaboration across these settings. They are generally in an earlier stage of development than the other networks described here. These networks include Whole Person Care Pilots, a waiver program focused on vulnerable populations and funded by the California Department of Health Care Services (DHCS), and other data networks enabling referrals from health care providers to community-based and government social service providers (housing, food banks, etc.). With the transition from Whole Person Care to CalAIM, data sharing across sectors will only become more critical to meet the rigorous new requirements for qualifying patients and managing them over time.[3]

Prominent Data Exchange Networks: Characteristics and Key Metrics, by Network Type

	DATA EXCHANGE SERVICE PRIORITIES	REACH (FOOTPRINT IN CALIFORNIA)	PRIMARY PARTICIPANTS	GOVERNANCE	GAPS/CHALLENGES
EHR-Centered Clinical Data Exchange					
Hospital and Health Systems Integrated health and hospital systems' EHRs and supporting technology ("enterprise HIOs")	Record of all clinical services provided by a health system to its patients; integration of external data as available; increasingly, analytics tools for population health management; benefit from participating in all the networks below.	Most health and hospital systems in California have taken significant strides to integrate their numerous data systems, centered on their EHR. EXAMPLES Kaiser Permanente, Sutter Health, and Contra Costa County Health Care Services use Epic; Common Spirit and USC (Univ. of Southern CA) use Cerner.	Providers and staff within the health system; may extend to nonemployed provider network; patients can access some information through health system patient portals	System-driven	▸ Limited to members of organization and contracted providers ▸ Limited behavioral health (BH) and social determinants of health (SDoH) data
EHR Vendor Networks EHR vendor networks allow provider organizations that use a vendor's EHR to share clinical data with other users of that EHR.	Clinical data sharing across a vendor's client base creates more access to complete patient records.	These networks are prevalent in both inpatient and ambulatory settings across the state; they have limited reach into nonmedical settings like BH and social service organizations. EXAMPLES Care Everywhere, the network internal to the EHR vendor Epic, exchanged 221 million records nationally during one month in late 2020 (includes data shared with other vendors).[4]	Hospital and provider organizations with the same EHR vendor	Vendor-driven with user input	▸ Limited to providers using a particular vendor's EHR platform ▸ Limited BH and SDoH data
National Networks (eHealth Exchange, Carequality, Commonwell, and DirectTrust) National networks exchange clinical records between provider organizations and health systems by establishing common data-sharing agreements and standards.	Exchange of electronic clinical data across diverse provider organizations and networks	Major health systems, large EHR vendors, clinics, and physician practices EXAMPLES Hospital systems access data from each other; many clinics in CA can access hospital data for transitions of care.	Health systems, EHR and other vendors, government agencies, regional HIOs and similar networks, practices that use certain EHRs	Combination of system-driven and vendor-driven; nonprofit organizations	▸ Not all EHR vendors or provider organizations participate ▸ Not all clinical data in participants' underlying systems can be exchanged ▸ Relatively cumbersome exchange workflows without customization, impacting smaller provider organizations that lack significant internal IT resources ▸ Limited BH and SDoH data

Prominent Data Exchange Networks: Characteristics and Key Metrics, by Network Type, *continued*

	DATA EXCHANGE SERVICE PRIORITIES	REACH (FOOTPRINT IN CALIFORNIA)	PRIMARY PARTICIPANTS	GOVERNANCE	GAPS/CHALLENGES
Community-Based Clinical Data Exchange Networks					
Health Information Organizations (HIOs) Typically regionally-based nonprofit networks, supported by unaffiliated health care organizations	Robust clinical record for individuals in service area; lab results delivery and hospital event notifications; growing analytics capabilities for population health management	▸ 15 HIOs in CA with participants in at least 39 of 58 counties in California ▸ More than 20 million messages exchanged per month on patient encounters[5] EXAMPLES ▸ Most HIOs focus on building density in their home geographies. ▸ One HIO, Manifest MedEx, has presence in multiple regions, with 120 hospitals, 700 ambulatory sites, and eight health plans participating across the state.	Hospital and provider organizations, county health services organizations (especially primary care and BH), payers, other stakeholders	Typically, participant-driven	▸ Variable participation and service levels ▸ Large areas of the state with no significant HIO ▸ Financial sustainability questions ▸ Limited BH and SDoH data
California Trusted Exchange Network (CTEN) Network connecting HIOs, health systems, and others including CA state agencies	Exchange of electronic clinical documents; primary data network for the CA EMS (emergency medical services) data system PULSE (Patient Unified Look-up System for Emergencies)	15 participating organizations in CA, most of which are HIOs, with the addition of several major health systems and state agencies including EMS and DHCS[6] EXAMPLES HIOs in San Diego and Santa Cruz can query each other for information on common patients.	HIOs, health systems, and California state agencies (EMS and DHCS)	User-driven, managed by CAHIE, a public/private partnership supported by the state of California	Not all clinical data in participants' underlying systems can be exchanged, and technical methods of exchange are limited, but network is more able to respond to CA-specific needs than national networks because participants are local; limited number of participating organizations.
Patient-Centered Data Home Network-of-networks approach connecting HIOs	Enables a patient's "home" HIO to be notified when the patient receives care outside of their HIO's service area.	45 HIOs nationwide, with 5 HIOs in CA participating in the western US regional network[7] EXAMPLES Data sharing between HIOs in San Diego, Santa Cruz, and northern Central Valley with HIOs in Texas and Utah.	Regional and state HIOs nationally	Participant-driven; managed through a national HIO association, the Strategic Health Information Exchange Collaborative	▸ Minority of CA HIOs participate ▸ Governance managed by a national nonprofit ▸ Only nonprofit HIOs can participate

Prominent Data Exchange Networks: Characteristics and Key Metrics, by Network Type, *continued*

	DATA EXCHANGE SERVICE PRIORITIES	REACH (FOOTPRINT IN CALIFORNIA)	PRIMARY PARTICIPANTS	GOVERNANCE	GAPS/CHALLENGES
Specialized Clinical Data Exchange Networks					
Clinical Event Notifications Event notification services used to coordinate patient care, most commonly via ADT (admission, discharge, transfer) messages.	Notifications sent to providers and/or embedded in their EHR when their patients receive services in other organizations; patient information beyond the ADT shared depending on the specific service.	Collective Medical Technologies (CMT) supports about 50% of CA hospitals with an ED (178 of 340 hospitals) and 744 skilled nursing facilities.[8] EXAMPLES CMT embeds alerts in a provider's EHR; alerts summarize actionable information about the patient, such as drug-seeking behavior, security threats, existing diagnostic and lab results, and care team contact information.	Hospital and provider organizations, payers	Health care hospital and provider organizations	▶ Inherently limited in scope because shared data are just a portion of the full patient record ▶ While scope is narrow, data provided by these networks are designed to be especially actionable. ▶ Emerging but limited connections between clinical, behavioral, and social service organizations
Other Specialized Data Exchange (e.g., labs, prescriptions) Networks for exchange of specific types of clinical data.	Sharing of specific types of data and health care transactions, such as e-prescriptions or diagnostic lab results	Critical infrastructure in specific areas such as e-prescribing and lab results delivery EXAMPLES Surescripts, the leading e-prescribing network, counts 95% of US providers as members of its network.[9]	Hospital and provider organizations; ancillary providers (pharmacies, labs)	Vendor-driven	▶ Inherently limited in scope because they generally involve a single data type ▶ Many primarily deliver one-way sharing for specific use cases. ▶ While scope is narrow, data provided by these networks are designed to be especially actionable.
Whole-Person Data Exchange Networks[10]					
Whole Person Care (WPC) Pilots[11] Medi-Cal delivery system integration pilots focused on high-risk populations; most managed by county health departments.	Clinical data sharing within CA counties, combined with tools for collaboration across organizations and sectors, including BH and SDoH data	▶ 26 individual pilots in California ▶ Approximately 200,000 enrolled WPC enrollees as of June 2020[12] ▶ CalAIM to scale up WPC approaches EXAMPLES Alameda County, which lacked an HIO, developed a robust data exchange system combining clinical, BH, and SDoH data with collaboration tools; has emerged as a viable Community Information Exchange (see note 11).	Driven by county health departments, with local participation from hospital and provider organizations, social services providers, other stakeholders	Government-driven, at the state and county levels	▶ Variable levels of integration and coordination across service sectors, depending on the county or pilot ▶ CalAIM will shift control to managed care plans and bring significant implementation risk.
Social Services Referrals Networks These initiatives focus on data sharing to enable social service coordination through referrals from health care organizations to non-health care social service organizations.	Referral and coordination tools that leverage "electronic phone books" of service providers	Rapidly emerging capability across the state, partly driven by major health systems and payers, and sometimes related to county-based WPC initiatives. EXAMPLES In Los Angeles, L.A. Care has partnered with Aunt Bertha for access to a social service referral platform for use by contracted provider organizations.	Hospital and provider organizations, county and public health services, social services, payers, other local stakeholders	Mix of participant-driven and vendor-driven	▶ These networks are gaining a significant footprint only now. ▶ Implementation is complex and there are significant organizational growing pains. ▶ Most platforms lack the ability to support shared care planning, which is required by WPC and CalAIM.

About the Author

Mark Elson, PhD, the principal of Intrepid Ascent, and members of his team developed this snapshot. Intrepid Ascent supports communities in the exchange and use of data to improve health.

About the Foundation

The California Health Care Foundation is dedicated to advancing meaningful, measurable improvements in the way the health care delivery system provides care to the people of California, particularly those with low incomes and those whose needs are not well served by the status quo. We work to ensure that people have access to the care they need, when they need it, at a price they can afford.

CHCF informs policymakers and industry leaders, invests in ideas and innovations, and connects with changemakers to create a more responsive, patient-centered health care system.

For more information, visit www.chcf.org.

Endnotes

1. Health information exchange infrastructure has two primary components, technical and governance, both of which are examined in this report.
2. As such, this overview does not address claims data and payment systems, state-level disease registries, public health surveillance databases, or quality reporting. The full report, to be published in spring 2021, will provide examples of how these parallel ecosystems at times do inform decisionmaking at the point of care (e.g., the state CURES database, public health labs with COVID-19 test results, and claims data integrated into clinical services).
3. Another Medi-Cal program, Health Homes for Patients with Complex Needs, provides an additional foundation for CalAIM through investments made by Medicaid managed care plans, although these investments did not result in infrastructure for data sharing across sectors to the extent seen with Whole Person Care.
4. Kat Jercich, "Epic's Care Everywhere Interoperability Platform Shows Big Jump in Data Exchange," *Healthcare IT News*, December 14, 2020.
5. "HIE in California," California Assn. of Health Information Exchanges, n.d.
6. "CTEN," California Assn. of Health Information Exchanges, n.d.
7. "Patient Centered Data Home," Strategic Health Information Exchange Collaborative, n.d.
8. Information provided by CMT.
9. Kate Rusciano, "Why It Matters: Prescribers Can Now Access Accurate Medication History Data for Virtually Every American," Surescripts, May 31, 2019.
10. Such a network is sometimes referred to as a "Community Information Exchange" (CIE). Whole Person Data Exchange Networks was selected as a heading instead for the following reasons. First, DHCS refers to "Whole Person Care Approaches" as an organizing concept for the CalAIM program, and the networks described here support this approach. Second, being a relatively new term, CIE means different things to different people — usually either corresponding to social referrals or to comprehensive exchange and use of medical, behavioral, and social data within a community. With the latter of these two definitions, CIE remains more of a goal than a reality in California today.
11. Health Homes represented another Medi-Cal delivery system integration pilot run through the managed Medicaid plans. This program did not emphasize cross-sector data sharing. As a result, the development of data exchange infrastructure was limited in this program.
12. For more information about Whole Person Care, please visit the "Whole Person Care Pilots" page on the DHCS website.